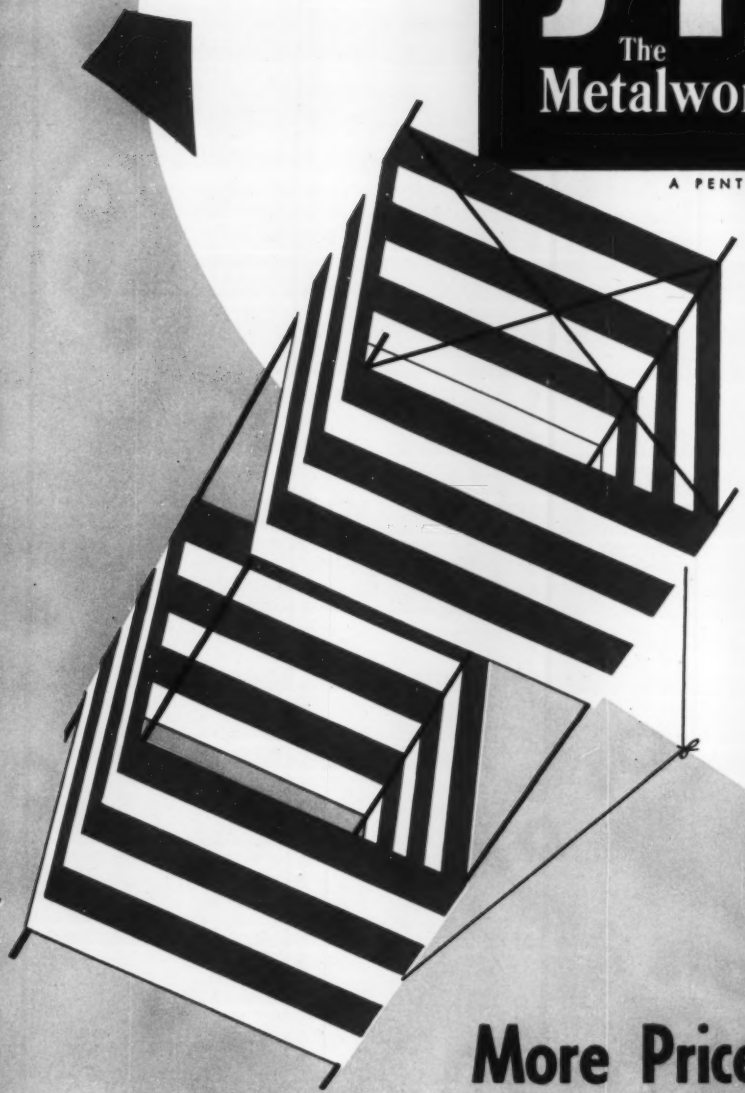
APRIL 8, 1957

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

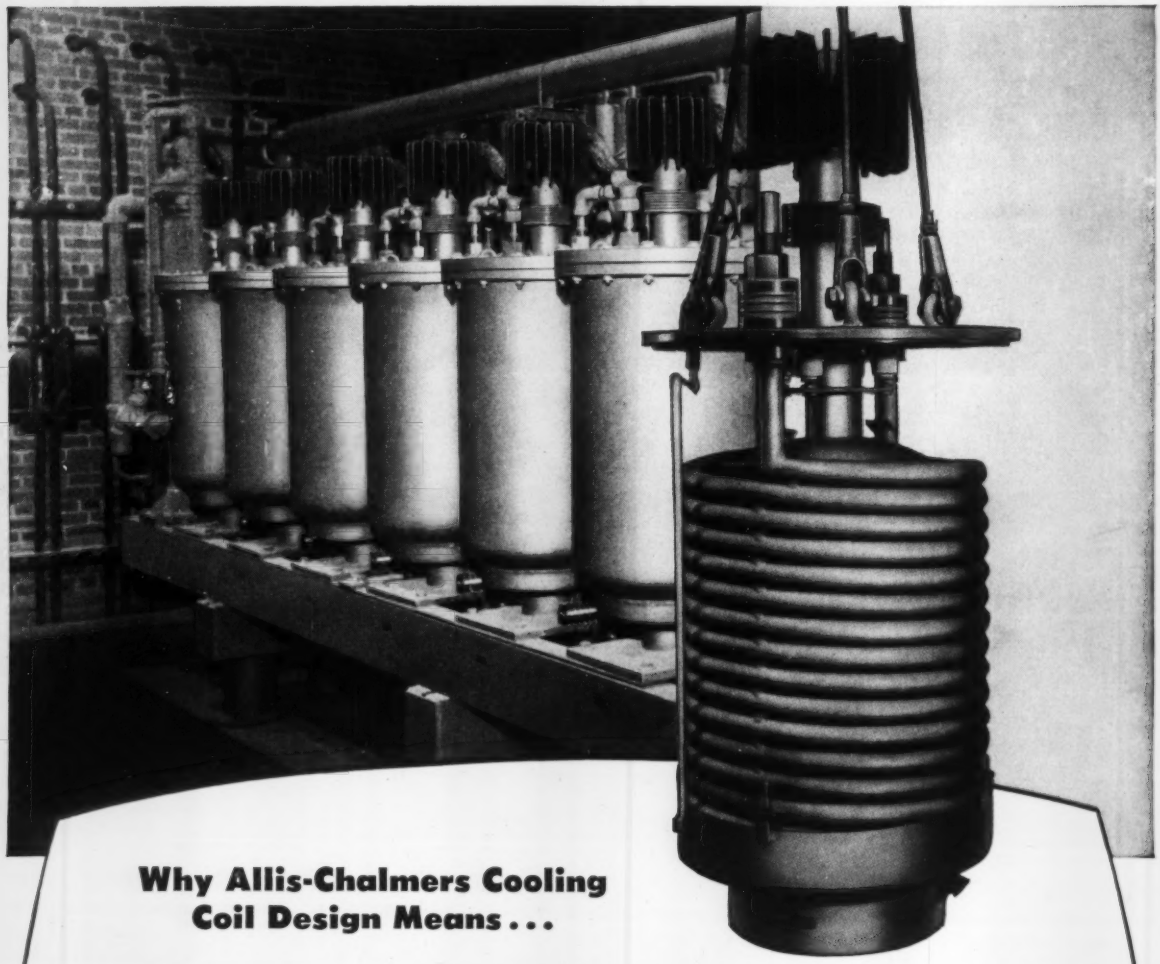


More Price Hikes Due

Moderate rise in components, equipment . . . page 59

- **Brazing Stainless Steel Honeycomb Panels —page 92**
- **Wheeling Steel's Formula for Success —page 141**

CONTENTS — PAGE 5



Why Allis-Chalmers Cooling Coil Design Means . . .

Better Rectifier Operation

More Efficient Heat Transfer results from internal cooling coil. The steel coil surrounds active parts, offering more cooling surface and better heat transfer than other types. Unit maintains more uniform temperature and mercury vapor pressure.

Simplified Maintenance results from Allis-Chalmers unique unit construction. All active components are attached to the anode plate for easy withdrawal, dismantling, and re-assembling — as illustrated above.

Positive Arc Barrier is formed by the cooling coil, which is insulated from the tank. The main arc is confined within the coil, preventing arc transfer to the tank.

Years of Operation in hundreds of installations have proved the reliability, ease of operation, and simplified maintenance of Allis-Chalmers mercury arc rectifiers. You can get complete information at your nearby A-C office, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

LIVE BETTER ELECTRICALLY

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

A-5084

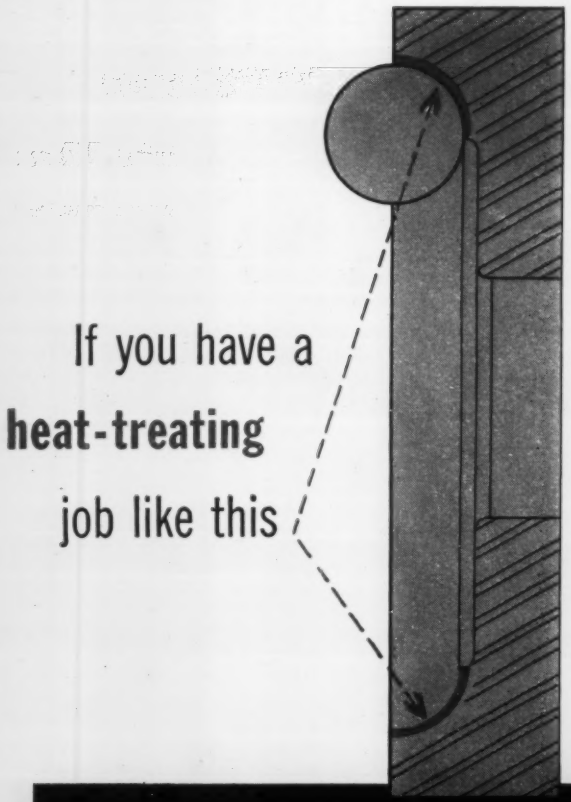
THIS ROTARY CAR DUMPER can handle two 90-ton hopper cars simultaneously every four minutes. Main members of the unloader were made of Mayari R high-strength, low-alloy steel to resist fatigue caused by vibration, and to combat the corrosive effects of industrial atmosphere. The high strength of Mayari R, together with its corrosion-resistance, excellent welding properties, superior paint-adherence and other qualities have made it the choice for a wide variety of applications. Our Catalog 353 discusses Mayari R in complete detail.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

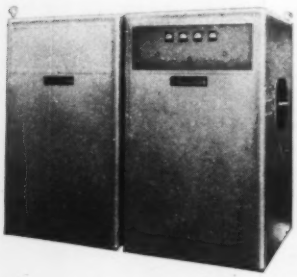
Mayari R...High-Strength, Corrosion-Resisting Steel

BETHLEHEM STEEL



If you have a
heat-treating
job like this

You need an
Induction Heating Machine
like this



New TOCCOtron Machine
50 kw 500,000 cycles

For many years TOCCO has led the Induction Heating Field—manufacturing both motor-generator and vacuum tube oscillator type machines to meet every induction heating requirement. This new 50 KW TOCCOtron unit is a big brother to the 25 KW unit which has been serving the Metal-Working Industry for many years.

Here's What It Does

With a frequency range of 350,000 to 600,000 c.p.s. the TOCCOtron unit is ideal for surface hardening small diameter parts to shallow depths (as the bearing race illustrated above), through hardening or annealing small sections and soldering or brazing small assemblies where the heating effect must be very strictly localized.

The greater capacity of the new 50 KW TOCCOtron *doubles* production rates formerly achieved by TOCCOtron equipment.

A Really Complete Machine

This radio frequency unit is a truly complete induction heating machine. It contains not only all the direct current supply components and the oscillator components, but also all the control components required for either single or two station operation.

Among the standard features of the 50 KW TOCCOtron are:

1. The industrial heavy gauge steel cabinet which completely encloses all high potential circuits preventing radiation interference and personnel hazards.
2. Meters in all sensitive circuits to enable the user to obtain the maximum output and efficiency.
3. 3-phase quadrature filament excitation of rectifiers for maximum life.
4. Externally adjustable grid bias and drive control for ease in setting up new production runs.
5. Externally mounted circuit breaker and disconnect located so that it is easily accessible.
6. Tapped plate transformer allowing variations of plate voltage.

If your operation requires the hardening, annealing or brazing of very small parts in very big quantities the new 50 KW TOCCOtron can do the job better, faster and at lower cost than any other method available.

THE OHIO CRANKSHAFT COMPANY

***Mail Coupon Today*— NEW FREE Bulletin**

The Ohio Crankshaft Co. • Dept: S-4, Cleveland 5, Ohio

Please send catalog G showing TOCCO Induction Heating Equipment from 60 to 600,000 cycles.

Name_____

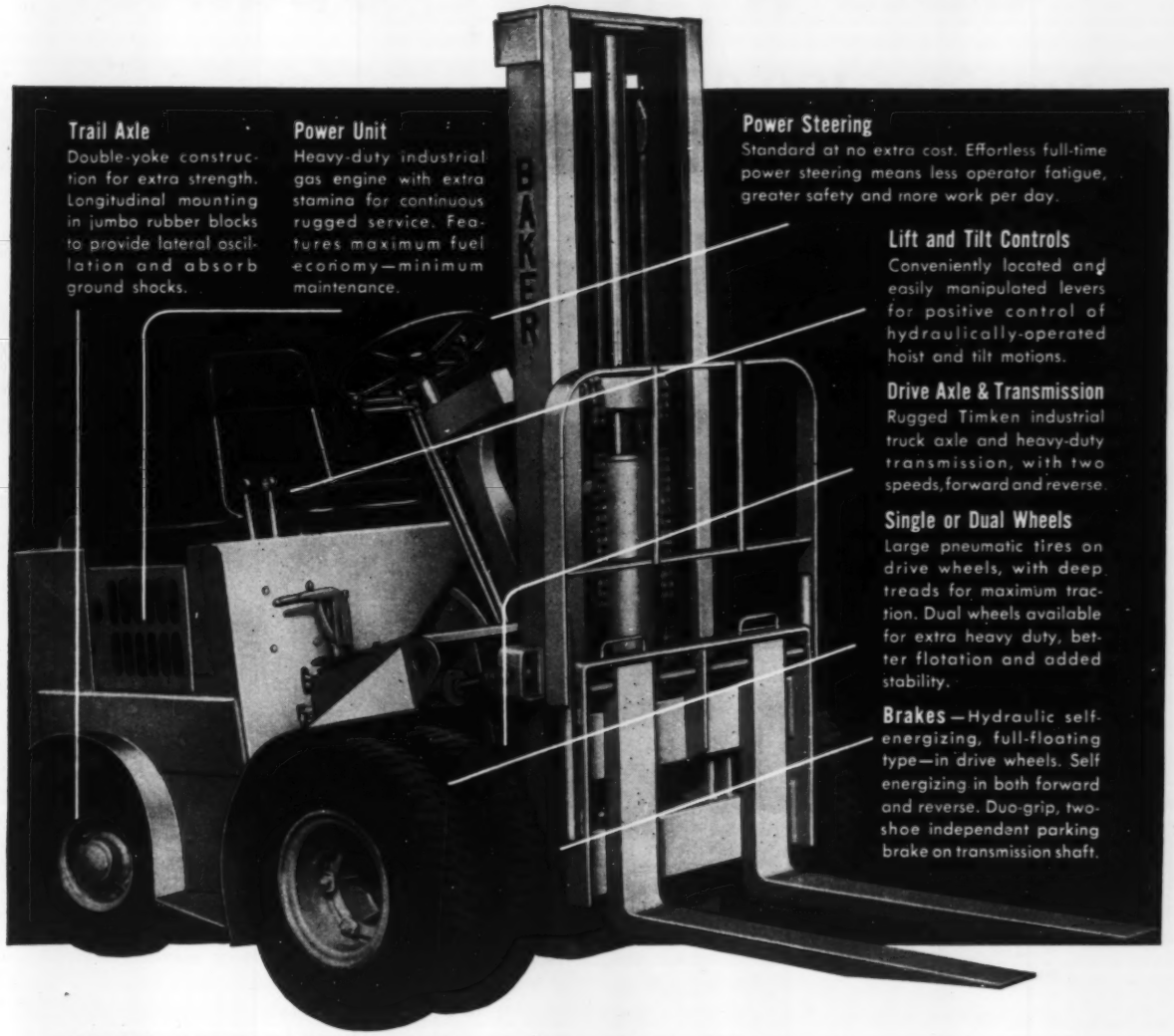
Position_____

Company_____

Address_____

City_____ **Zone**____ **State**_____

BAKER announces an ALL NEW PNEUMATIC-TIRED FORK TRUCK


Trail Axle
Double-yoke construction for extra strength. Longitudinal mounting in jumbo rubber blocks to provide lateral oscillation and absorb ground shocks.
Power Unit
Heavy-duty industrial gas engine with extra stamina for continuous rugged service. Features maximum fuel economy—minimum maintenance.
Power Steering
Standard at no extra cost. Effortless full-time power steering means less operator fatigue, greater safety and more work per day.
Lift and Tilt Controls
Conveniently located and easily manipulated levers for positive control of hydraulically-operated hoist and tilt motions.
Drive Axle & Transmission
Rugged Timken industrial truck axle and heavy-duty transmission, with two speeds, forward and reverse.
Single or Dual Wheels
Large pneumatic tires on drive wheels, with deep treads for maximum traction. Dual wheels available for extra heavy duty, better flotation and added stability.
Brakes—Hydraulic self-energizing, full-floating type—in drive wheels. Self energizing in both forward and reverse. Duo-grip, two-shoe independent parking brake on transmission shaft.
BAKER

This Baker FGF-40, 4,000-lb. YARDLOADER, first in the new line of Baker pneumatic-tired gas fork trucks, has many new design features for greater maneuverability and more dependable performance. It is *fast*—top speed with load, 8.6 mph. It is *compact*—only 48 inch wheelbase, and minimum overhang—*and only 79 inch turning radius.* Low center of gravity makes this possible without sacrificing stability.

Absence of cowl provides maximum visibility. Power steering and many other driver conveniences make it one of the easiest handling fork trucks—and one of the safest. Full 130-inch lift, with single or dual cylinder. Truck-loading mast available with 110-inch lift and 71-inch overall height . . . For complete information ask for Bulletin 1382.

Baker
industrial trucks

THE BAKER-RAULANG COMPANY
1259 WEST 80th STREET • CLEVELAND 2, OHIO
A Subsidiary of Otis Elevator Company

Otis
7G1

NEW

Data-Readout Counter

Provides 100,000 Distinct Circuit Arrangements

Electrically actuated data readout counter with electric reset. Form B-1538 for 110V AC/DC.

FUNCTIONS

Analog to Digital Conversion
Serial or Parallel Circuit Transmission
Continuous or On Demand Electrical Readout
Continuous Visual Readout
Visual and Electrical Data Storage
Predetermining
Repeat Predetermining
Sequential Programming

Veeder-Root's new series of Data Readout Counters combines visual indication with electrical readout for remote indication, recording, and controlling applications. *Electrically* or *mechanically* driven and provided with *manual* or *electric* reset, these counters present a positive display of accumulated totals and automatically create specific control circuit contact closures for each number visually displayed. Each instrument, with its five figure capacity, provides 100,000 distinct circuit arrangements which lend themselves to the most exacting control and transmission requirements. The counters are compatible with standard data processing equipment and offer a wide variety of applications in the industrial control and data processing fields.

Veeder-Root Inc.

"THE NAME THAT COUNTS"

Hartford, Conn. • Greenville, S. C. • Chicago • New York • Los Angeles
San Francisco • Montreal • *Offices and Agents in Principal Cities*

IN THIS ISSUE

STEEL
the Metalworking Weekly

April 8, 1957
Vol. 140 No. 14

METALWORKING OUTLOOK

53 **Three problems for tomorrow's engineers:** More basic materials, more efficient use of power, increased productivity

COVER ARTICLE

59 **Price hikes for components and equipment shape up**—Trickle will turn into steady drizzle after July 1

62 **Can costs be cut** to build ingot capacity?

63 **More Canadian ore**—Pickands Mather and Canadian Javelin sign pact

☑ 64 **Unique foreman training program**—Cleveland groups co-operate in it

65 **Catastrophic insurance**—It's a fringe benefit that may grow

69 **UK seeks more technicians**—School expansion, scholarships in new plan

69 **Euratom and Euromarket treaties signed** by six nations

70 **Olin set to roll aluminum**—Report on joint venture with Revere

71 **Launching a new product**—Five rules for bettering chances of success

87 **Link-Belt expands**—Will build $5-million plant at Indianapolis

TECHNICAL OUTLOOK

91 **Scarfing score:** Nearly 20 per cent of all steel to be produced in U.S. this year will be machine scarfed. That's 3 per cent over '56

☑ 92 **Brazing stainless steel honeycombs**—Vacuum process offers most promise

94 **Honeycombs for B-58 are brazed**—How Convair's technicians do it

96 **Yardstick for worker performance**—Production rate meter gives operator, foreman data on minute-by-minute operations

98 **Industrial TV cuts setup, machining times** on big milling, boring machine

100 **Progress in Steelmaking**—Closer control for the blast furnace

103 **Plan building for material handling**—Some rules and a check list

☑ 114 **Bearings for tough jobs**—Difficult environments, high temperatures and nuclear reactors are discussed in separate articles

MARKET OUTLOOK

139 **Support seen for steel rate**—Indexes and composites, 149; steel prices, 151; ores, 157; ferroalloys, 158; scrap trends, 161, prices, 162

141 **Wheeling Steel's formula for success**—Closely knit operations, self-sufficiency and versatility keep steelmaking rate above national average

164 **Nonferrous metals**—Strikes hit foreign copper mines—Prices, 166

REGULAR FEATURES

6 Behind the Scenes
10 Letters to the Editors
16 Staff
23 Calendar of Meetings
57 The Editor's Views
66 Windows of Washington
74 Mirrors of Motordom
77 The Business Trend
81 Men of Industry
84 Obituaries
106 Machine Topics
121 New Products
136 New Literature
169 Advertising Index

Published every Monday by The Penton Publishing Co., Penton Bldg., Cleveland 13, O. Subscriptions in the U.S. and possessions and Canada, $10 a year; all other countries, $20. Current issues, 50 cents each. Metalworking Yearbook issue, $2. Accepted as controlled circulation publication at Cleveland. Copyright, 1957, The Penton Publishing Co.

Index available semi-annually. STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

The clocks keep ticking away. We need your dollars to make each minute count in the fight against cancer.

With $70, we can buy an eyepiece micrometer . . . $48 buys a laboratory flowmeter...$15 buys an instrument sterilizer . . . $3.75, a hematocrit reader.

Only you can decide how much you can afford to send. But send it *today*, to help us keep moving ahead in the struggle to save lives.

Send a generous check to "Cancer" c/o your local Post Office.

AMERICAN CANCER SOCIETY

behind the scenes

Prices To Flounder?

Away back in our Mother Goose days (and, brother, that's remembering when!) we were particularly fascinated by an old bat who really had it made: She made a sneaky blackmail deal with a flounder who could interpret dreams, pull strings and foretell the future, and she was angling for the pope's job when the flounder finally pulled the rug from under her. The moral of the story was that a person could be tripped up by greed, but we preferred to think that it was that even a flounder could be pushed too far—and anyway, the only reason the bloody flounder ever got into this paragraph is because it could foretell things.

When the old bat was confused, she would make like a setter and chant: "Flounder, flounder in the sea, hither quickly come to me; I dreamed a monarch shaved with shells, so tell me, pray, what this foretells." The flounder appeared in a wink, rattled off the explanation, and took off again for the deep sea.

Well, when Assistant Editor Brian Wilson received the assignment to assemble and organize the price outlook story (page 59) he could have used that talented flounder. He would have made like a pointer and chanted: "Flounder, flounder in the sea, hither quickly come to me, and tell me, from this mess of figgers, will prices soon be small or bigger?"

The "figgers" placed in Brian's possession came from a STEEL survey of more than 300 purchasing agents, and one of the conclusions reached is that wholesale prices in metalworking will rise 3.9 points by the end of this year. We are still awaiting the flounder's report, but it is bound to coincide: STEEL's forecasts have been frighteningly accurate over a considerable period.

Metallurgical Tizzy

Differences of opinion help keep the world whirling round and round, and it's always a joy to leap into what young reporters used to call a fracas. Some of the most enjoyable fights are those in which the onlooker has no personal preference: He jumps in just for the excitement. Being a victim of these wicked impulses, we find ourselves leaping into a battle now raging between the International Union of Pure & Applied Chemistry and certain hardheaded metallurgists and publishers.

It all began on Nov. 26, 1801, in the course of a meeting of the Royal Society, London, when Charles Hatchett rose and read an analysis of a mineral substance from North America containing a metal hitherto unknown. He called it columbium in honor of the continent from whence it was derived. Forty-five years later a double mistake in chemical research resulted in columbium being termed niobium, and for more than a century element 41 staggered along under two names.

Several years ago the IUPAC came out in favor of niobium, and urged everybody to fall in line. Most metallurgists and publishers preferred columbium, and the battle was joined. STEEL prefers columbium, and we do, too, and if any of you niobium boys want to look up the current price of the stuff under STEEL's nonferrous metals, it won't do any good to look under the Ns. (Incidentally, in the event that somebody might ask you, the going price of columbium is $119.20 per pound.)

Weighted Price

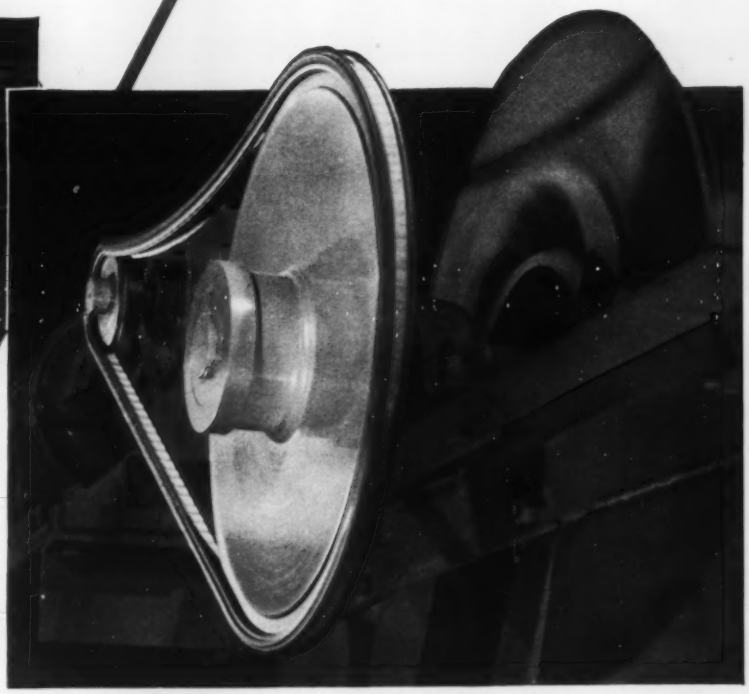
After grandma died, grandpa thought it would be a sentimental gesture to have a pet alligator in the house. "Ever' time the critter opens its mouth," he sighed, "it will remind me of the way she used to snap at me." So he saved his dimes, including the Roosevelt ones—live and let live, he used to say—until he had 2 lb 3½-oz of the bright little coins. He traded them for a splendid specimen named Leonard. Can you guess what Leonard cost?

Shrdlu

(Metalworking Outlook—Page 53)

It's not just static strength...

RESISTANCE TO TENSILE STRESS is achieved by use of properly heat-treated, accurately-machined side bars made of premium steel and fitted with properly-hardened pins, bushings and rollers. But to resist *operational* stresses, additional controls over dimensional accuracy, uniformity and roller resiliency are essential.



STRENGTH OF CHAIN IN MOTION is accomplished through tensile strength *plus* special Link-Belt refinements. These include pitch-hole preparation, micro-finish of parts, special processing of sidebars, prelubrication and rigid quality control from initial selection of materials to final protective boxing.

it's *dynamic strength*

in LINK-BELT Roller Chain that fights fatigue

ON high-speed drives or heavy conveying jobs, the components of every pitch of roller chain face severe and repeated operating stresses—engagement with sprockets, shock of starting loads, centrifugal loads and others. That's why *dynamic strength*—ability of chain to resist these stresses—is so important. And it's built into *every length* of Link-Belt Precision Steel Roller Chain.

How is dynamic strength developed? In addition to Link-Belt "extras" . . . special design, manufacturing and processing steps provide required properties of uniformity and accuracy for long-life operation.

Talk over your roller chain needs at your nearby Link-Belt office or authorized stock-carrying distributor. Ask for Book 2457, covering this complete line of single and multiple widths, in ¼ to 3-inch standard pitch, 1 to 3-inch double pitch.

14.122

LINK-BELT

ROLLER CHAINS & SPROCKETS

LINK-BELT gives you dynamic strength that comes from these important EXTRAS

PRE-STRESSING of multiple width chain provides uniform load distribution.

SHOT-PEENED ROLLERS have greater fatigue life, added ability to withstand impact.

CLOSER HEAT-TREAT CONTROL —coupled with rigid testing insures uniformity.

LOCK-TYPE BUSHINGS (applied on a range of sizes) end a cause of stiff chain.

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

Scott Wipers are used at Centralab Division of Globe-Union Inc., where electrical circuits are being painted. Scott Wipers are 2-ply paper, chemically treated and "perf-embossed." This exclusive process* creates angled surfaces which provide thorough cleansing action and speed absorption of liquids.

WIPER PROBLEM? Look what Centralab did with Scott Wipers!

Versatile Scott Wipers are especially useful in operations where products or equipment must be kept free of lint. This is one of the most important reasons why they are used extensively by the Centralab Division and three other plants of Globe-Union Inc., Milwaukee, Wisconsin.

Among many electronic developments pioneered by the Centralab Division is the metalizing of ceramic capacitors, or "packaged electronic circuits." This involves painting ceramic wafers with conductive silver, through fine-mesh screens. Scott Wipers are used to wipe screens clean. Since these paper wipers are lint-free, as well as highly absorbent, they are ideal for this purpose. In addition, the silver is readily salvaged from used wipers.

Scott Wipers are used for a wide variety of industrial wiping jobs, including those requiring solvents. Want more details? Call the local Scott representative or distributor. Or write Scott Paper Company, Department S-74, Chester, Pennsylvania.

SCOTT PAPER COMPANY

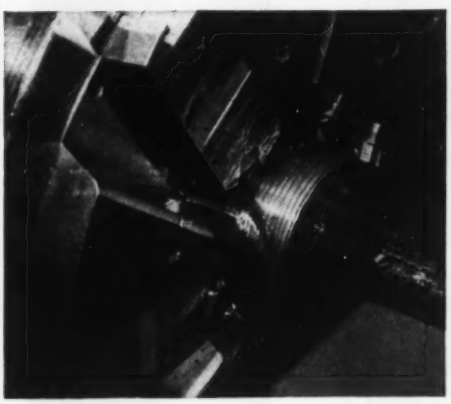
Makers of the famous Scott paper products you use in your home.
Consult your local TV schedules for Scott's program, "Father Knows Best."

*Patent pending

"WE'D BETTER GET TRANSPARENT SUNICUT FOR THESE JOBS WHERE WE HAVE TO SEE THE WORKPIECE. JOE JUST CAUGHT HIS NOSE IN THE THREADING MACHINE."
LOCKE

For precision cutting...

TRANSPARENT SUNICUT OILS ASSURE YOU GOOD VISIBILITY, PEAK PRODUCTION



Transparent Sunicut oils assure excellent finish in critical operations at close tolerances. Good visibility speeds production.

Transparent Sunicut® oils, including heavy-duty and dual-purpose oils, are available in many grades to suit your specific needs. They give outstanding results...especially where precision cutting is required.

Their transparency takes the "blinders" from work that needs close watching, permitting close product control, faster production, lower unit cost. Machine operators like Sunicut's "cleanliness." Most important, *transparent Sunicut oils assure you of good finishes.*

For full information about Sunicut cutting oils, call your Sun representative, or write to SUN OIL COMPANY, Philadelphia 3, Pa., Dept. S-4.

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY

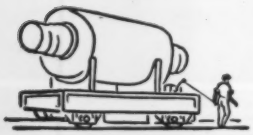
Philadelphia 3, Pa.

In Canada: Sun Oil Company Limited, Toronto and Montreal

SUNOCO®

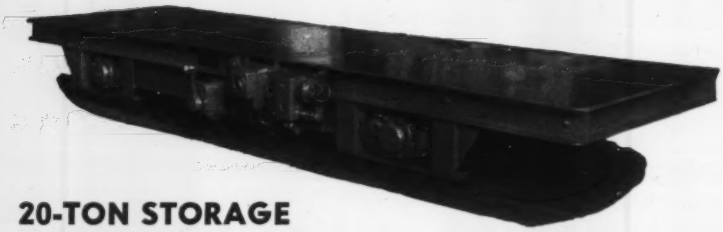
©Sun Oil Company

ATLAS SAFETY TYPE

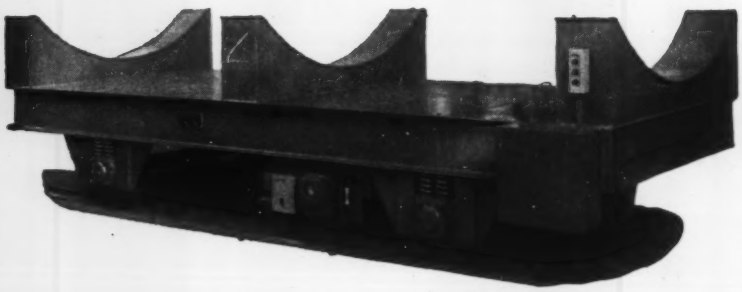


"SHORT HAUL" TRANSFERS

Atlas Safety-Type Transfers provide safe, low-cost service. Available with gas or diesel-electric, cable reel, or storage battery power. Atlas Transfers handle any type of load . . . and the heavier the load, the greater the savings.



20-TON STORAGE BATTERY FLAT CAR



20-TON STORAGE BATTERY WITH CRADLE FOR PIPE

Request "Walk-Along" Bulletin 1283

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

LETTERS
TO THE EDITORS

Great Value to Analyst

I would appreciate a classified index of STEEL for 1953 through 1956. Our commercial research department has found your publication to be of great help.

Also, please forward an extra copy of the article, "Warehouses Top List of Mill Customers" (Mar. 18, page 178). It is an excellent statistical classification and will be of great value to us.

J. R. Burton
Distribution Analyst
Commercial Research
Columbia-Geneva Steel Division
United States Steel Corp.
San Francisco

Reprint in Permanent Files

Your article, "More Work for Magnesium" (Jan. 28, page 105), is of definite interest to me. I would like a reprint for my permanent files.

E. H. Smith
Section Manager
Mechanical & Camera Devices
Technical Products Division
Allen B. DuMont Laboratories Inc.
Clifton, N. J.

Excellent Follow-Up

Please send four copies of the second article in your 1957 Program for Management, "Management Development — Grooming Middle Managers" (Mar. 18, page 93). This is an excellent follow-up of the first article, "Management Development—The Care and Feeding of the Junior Executive" (Feb. 11, page 93).

J. M. Rhodes
General Manager
Marine Fabricators Co.
Perth Amboy, N.J.

Porosity in Castings

The article, "Sealing Porosity in Metal Castings" (Mar. 4, page 120), is of interest to us. We would appreciate three reprints.

Armand J. Ledoux
Executive Vice President
Black Rock Mfg. Co.
Bridgeport, Conn.

Uses STEEL Facts in Chart

We have used your booklet, "Facts and Figures" (Jan. 7, page 167), in making up a chart which closely matches our own ups and downs. But we have questions on two points:

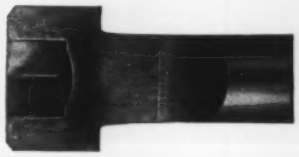
1. On page 173 of "Facts and Figures," you show annual steel production of 115,000,000 tons in 1956. What is the relation of this figure to the figures on steel production shown in the chart,

(Please turn to page 12)

The BUY word for Socket Cap Screws is ALLEN

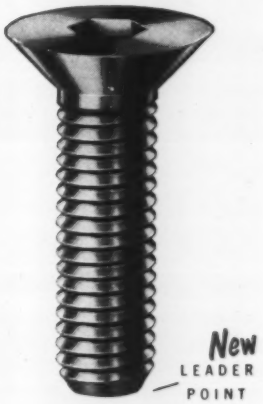
The *easy* way to make sure of greater strength, better fit and uniform quality in socket cap screws is to order "not just Allen-type but genuine ALLEN."

PRESSUR-FORMING



The latest improvement in the cold forging method originated by Allen. The tough Allenoy steel fibers are preserved continuous and uncut.

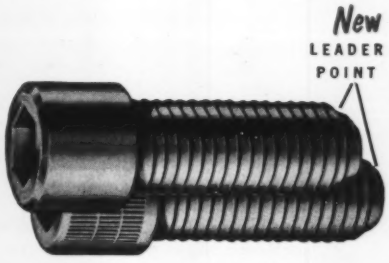
GRIP HEAD CAP SCREWS
The world's easiest starting, straightest driving, firmest holding cap screws.



FLAT HEAD CAP SCREWS
For firm fastening with flush surfaces. Especially adapted to fastening thin plates and sheets.

BUTTON HEAD CAP SCREWS
Produces smooth streamlined appearance where countersinking is impractical.

STAINLESS STEEL



Bright, non-corroding high tensile strength type 18-8. 151 popular sizes (NC & NF) with Smooth Heads *available from stock*. Also standard with Grip Heads in many popular sizes.

THE ALLENUT

Provides a ready-made threaded hole for use with cap screws in soft materials and for repair applications. Endless uses for compact design, space saving.

Sold Only Through

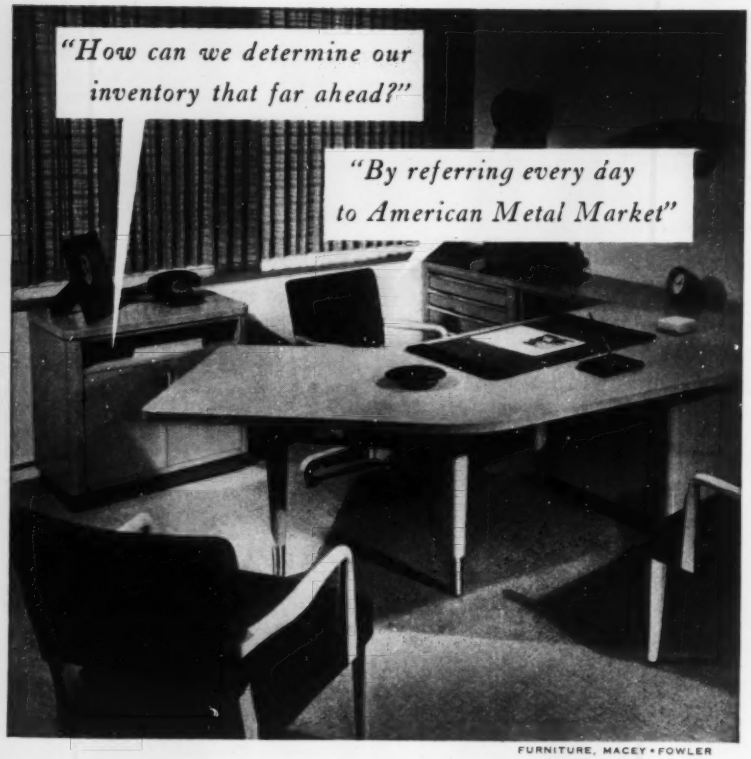
Leading

Industrial Distributors

Take advantage of their large stocks and fastener experience. Write direct for General Catalog G55.

ALLEN
MANUFACTURING COMPANY
Hartford 2, Connecticut, U.S.A.

ALLEN HEAD



FURNITURE, MACEY • FOWLER

Decision makers in the metals industry must be continually informed about prices and developments affecting their products. That's why 30,000 top executives read American Metal Market. The daily information they need is found only in its three major divisions: closing quotations here and abroad on all metals in all forms; potential impact of daily news on metal markets; potential impact of daily news from Washington on metal markets. Ahead of any other publication American Metal Market supplies the vital information link between the metals man and worldwide market conditions.

More advertisers place more linage in American Metal Market than in any other publication covering the metal-working industries.

Annual subscription, including 844-page Metal Statistics yearbook, $20.

ABC

THE MAN ON THE MOVE IN METALS KEEPS IN DAILY TOUCH THRU THIS DAILY MARKET AUTHORITY

American Metal Market

18 Cliff St., New York 38, N.Y.

1882 • 1957 75th ANNIVERSARY

THE DAILY NEWSPAPER OF THE STEEL AND METAL INDUSTRIES. ESTABLISHED 1882

LETTERS

(Concluded from page 10)

"Barometers of Business," in your Business Trend column of Mar. 4 (page 71)?

2. On page 179 of "Facts and Figures," you show total shipments of aluminum castings to be 589,753,000 lb for the first nine months of 1956. Where is a comparable figure available for current activity?

A. S. Amilon
Market Research Director
C. A. Norgren Co.
Englewood, Colo.

• *The figures on steel production in the Business Trend chart are weekly ingot production figures in thousands of net tons. For instance, a weekly production of 2,456,000 net tons of steel ingots is at an annual rate of 127.7 million tons. It isn't likely that the industry will continue to run at this rate all year. The year's output should be about 120 million tons.*

For current figures on shipments of aluminum castings, contact your nearest U.S. Department of Commerce office or get on its mailing list for the Facts for Industries *series, "Nonferrous Castings" (M24E), which is issued once a month. Since there is a two-month lag in the figures, March figures will be issued around the end of May. The price of this series is 10 cents a copy, $1 a year.*

Cold Roll Forming Cuts Costs

Please send five copies of the article, "Make Complex Shapes in Continuous Strips" (Mar. 4, page 95). We find it valuable and would like to distribute the reprints to our engineers.

K. Kanno
Chief, Marketing Research Section
Japan Steel & Tube Corp.
Tokyo

Article Causes Discussion

Your article, "Quality Control for Automatics" (Feb. 18, page 178), has been the basis of much discussion in our plant. It was interesting, enlightening and well written. I would appreciate receiving two reprints.

John Coppola
Quality Control Manager
Detroit Controls Corp.
Detroit

Where Do Facts Come From

Please send two copies of the article, "Exploring the Thermal Barrier" (Mar. 11, page 154).

It contains a wealth of information (and authoritative data) and is so expertly written that it would appear little effort was required to prepare it. How long did it take to get together, and how and where did you get all the facts?

The recent articles you have been publishing about the guided missile and rocket industries have proved educational and certainly in keeping with the times.

We accept all the information in your magazine as factual.

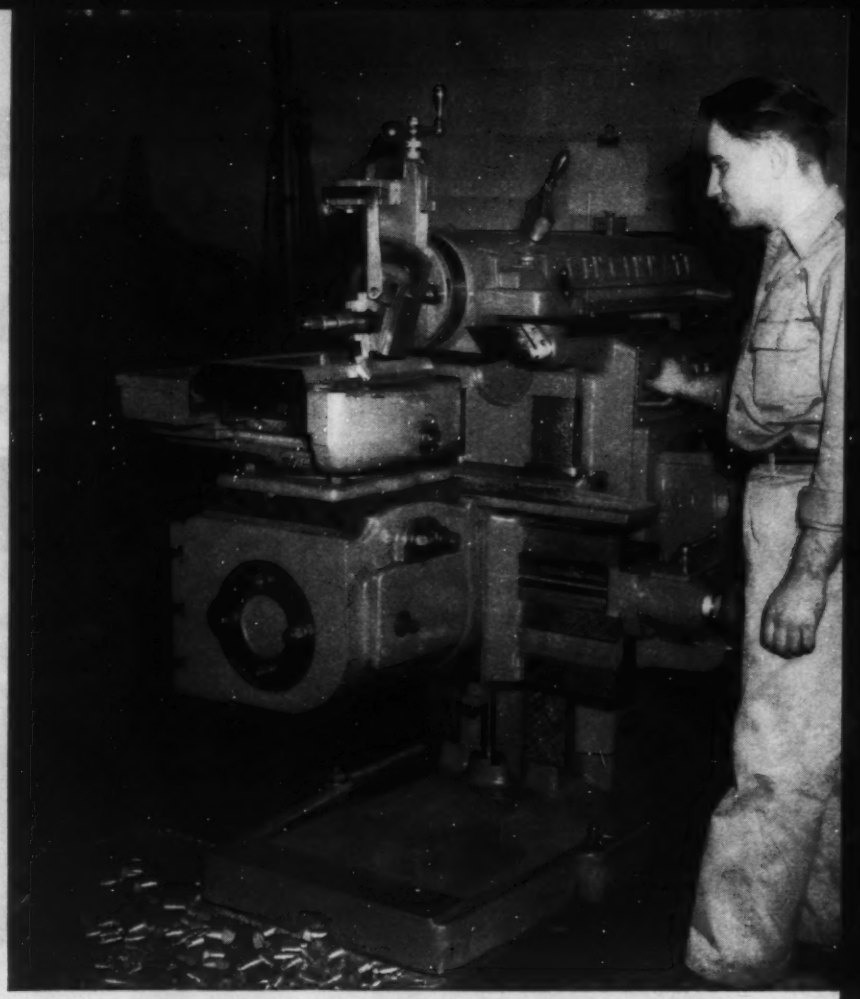
L. F. Megow
General Manager
Fabricated Steel Products Division
Hahn & Clay Machine & Boiler Works
Houston

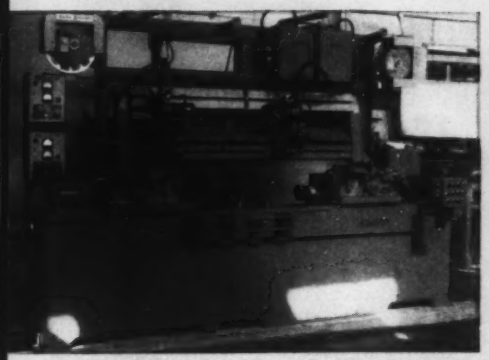
• *The material was compiled over a period of several months. It came from many sources in government, the aircraft and basic metal industries.*

Accurate heavy cuts by this Cincinnati Rigid Shaper

. . . at NATIONAL ELECTRIC WELDING MACHINES CO.

Bay City, Michigan





The steel slide being machined will be used on a National Automatic MIG arc welder, such as shown above.

Economical production of this steel slide for an automatic arc welder requires heavy cutting with maintained accuracy. The machine chosen for this job is a 16" Cincinnati Heavy Duty Rigid Shaper. Some of the features which make this performance possible are:

- Extreme rigidity due to heavily ribbed column.
- Exclusive Cincinnati 50 PSI pressure lubrication.
- Maximum accuracy due to extended ram bearing and slot-free ram.
- Fast, easy operation due to electro-magnetic brake and clutch with finger-tip control.

Write **Department C** for Bulletin "CINCINNATI RIGID SHAPERS". We also suggest you consult our Application Engineering Department on your machining problems.

Photos courtesy National Electric Welding Machines Co., Bay City, Michigan.

CINCINNATI

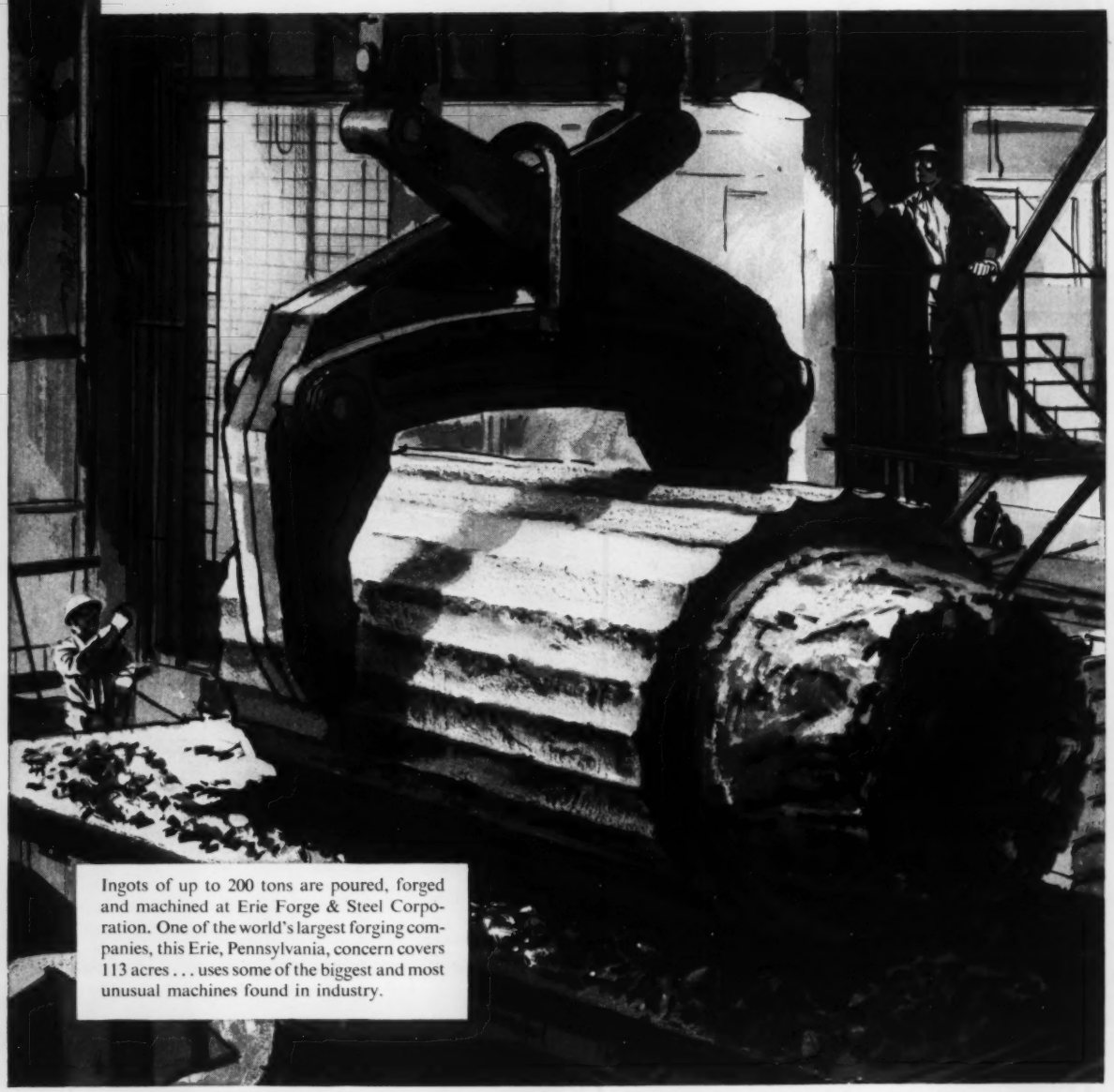
THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

Reg. U.S. Pat. Off.

Correct Lubrication in Action...

Re-Machining of Crank



Ingots of up to 200 tons are poured, forged and machined at Erie Forge & Steel Corporation. One of the world's largest forging companies, this Erie, Pennsylvania, concern covers 113 acres . . . uses some of the biggest and most unusual machines found in industry.

Mobil

SOCONY MOBIL

Leader in Lubrication for over 91 years

in the **Forging Industry**

shaft Pins Eliminated

–$30,000 SAVED!

One of many ways Erie Forge & Steel Corporation has cut production costs over $100,000 through the help of Socony Mobil

At Erie Forge & Steel Corporation, where the world's largest crankshafts are produced, equipment and methods are constantly scrutinized for ways to increase production and reduce maintenance costs. Plant records show how Socony Mobil has helped.

For example: During machining of Diesel crankshaft pins, metal particles welded to cutting tool tip. This excessive build-up resulted in rough finish of pin surfaces. This necessitated re-machining of up to 18 crankshaft pins a day.

A Mobil lubrication engineer analyzed the operation . . . recommended a special Mobil cutting oil. Rough finish trouble disappeared, resulting in savings of $30,000 in one year. *This one saving alone more than paid for the plant's annual cost of lubricants.*

This is Correct Lubrication in Action—the *only* program that combines 91 years of lubrication knowledge with the most experienced lubrication engineers and quality products. Why not find out how it can cut your operating costs?

This complete cost-cutting service can be yours!

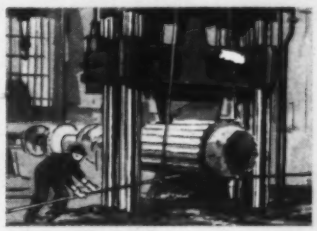
After a Mobil representative thoroughly analyzes your plant's lubrication needs, a program of Correct Lubrication is put into action. Here are some of the ways this program benefited the Erie Forge & Steel Corporation.

World's Greatest Lubrication Knowledge—Since 1866, Socony Mobil has worked with every type of industry, on every kind of machine operation. **This vast experience enabled Mobil to suggest a cleaning method to Erie Forge that eliminated monthly dismantling of hydraulic and circulating systems . . . saved $49,719 in four years.**

Continuous research and product development—Socony Mobil products are continually improved . . . new products developed to meet industry's latest needs. **A new Mobil extreme-pressure gear lubricant was recommended for Alliance 75-ton cranes. It cut wear under overload conditions . . . prolonged gear life . . . saved $1,500 in labor and material cost.**

Periodic product analyses—This service provides a thorough check on lubricant and machine performance . . . can detect trouble before it reaches the serious stage. **Analyses of samples taken from central coolant system at Erie Forge indicated bacterial contamination. Steps were taken to arrest condition, thus avoiding shutdown of all boring and sawing operations.**

Experienced engineers—Mobil engineers work closely with plant personnel . . . can call on years of practical experience to cut plant production costs. **At Erie Forge & Steel Corporation rams on hydraulic presses had to be repacked every two weeks due to high-temperature operation. Recommendation by Mobil engineer greatly extended packing life . . . cut labor costs . . . saved $20,000 in four months.**



Correct Lubrication

A proved program to reduce maintenance costs

SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP., MOBIL OVERSEAS OIL CO., INC.

CHILE	COLOMBIA	PERU	ARGENTINA
SPAIN	PORTUGAL	SO. AFRICA	SWEDEN
ISRAEL	JAPAN	BELGIUM	MEXICO
INDIA	AUSTRIA	BRAZIL	CANADA
ITALY	GERMANY	URUGUAY	ENGLAND
DENMARK	FINLAND	FRANCE	U. S. A.

24 NATIONS UNITED...

on Choice of Yoder Mills for Pipe and Tube Manufacture

It all started less than two decades ago with the introduction by Yoder—and the rapid adoption by American industry—of a revolutionary new type of mills for cold forming and electric-resistance welding of pipe and tubing. England, France, Italy, Mexico, Argentina, and Brazil soon followed the U.S.A. in adopting these mills. Other countries boasting any kind of modern metal working industry did likewise, even including distant Japan, India and South Africa. Production, depending on requirements, varies from 25,000 up to 75,000 feet per 8-hour shift.

●

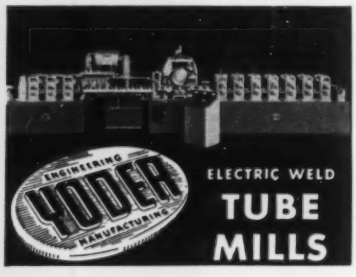
By this time, England, Italy and Argentina each have a total of ten Yoder mills in operation; Brazil, eight; Mexico, six; France, five; other nations somewhat in proportion to their population. In many nations, Yoder mills now supply from 50% to 90% of all welded tubes used. Several oustanding production records have been scored by operators in foreign countries, most recently in Italy. Reasons: the simplicity of design, ease of operation and dependability of Yoder mills. Secondly, generous assistance rendered by Yoder in training operators everywhere.

●

Through technological advances, Yoder leadership in tube mill design has been jealously maintained and strengthened from year to year. Ask for literature giving details of the latest improvements. Correspondence invited.

THE YODER COMPANY

5502 Walworth Ave. • Cleveland 2, Ohio, U. S. A.



STEEL
The Metalworking Weekly

Editor-in-Chief, IRWIN H. SUCH
Editor, WALTER J. CAMPBELL
Associate Managing Editors, VANCE BELL, JOHN S. MORGAN

WILLIAM M. ROONEY .....Market Editor
VAN CALDWELL .....Steel Plant Editor
HARRY CHANDLER .....Copy Editor
FRANK R. BRIGGS .....Associate Editor
ROBERT O. JAYNES .....Associate Editor
AUSTIN E. BRANT .....Assistant Editor
BYRON E. KENNEL .....Assistant Editor
ROSS WHITEHEAD .....Assistant Editor
GLENN W. DIETRICH .....Assistant Editor
HORACE L. SAMFORD .....Assistant Editor
ALLEN G. GRAY .....Technical Editor
ROBERT F. HUBER ....Machine Tool Editor
J. D. KNOX .....Consulting Editor
HAROLD B. WILSON .....Assistant Editor
WILLIAM V. WALLACE JR. ..Assistant Editor
MARY T. BORGERHOFF .....Assistant Editor
MARY ALICE EARLY .....Assistant Editor
EILEEN CORTES .....Assistant Editor
MARY ANN STUVE .....Editorial Assistant
JANE WEDGE .....Editorial Assistant
BETTY ZAYAC .....Editorial Assistant
THOMAS H. BRYAN, TOM WELSH, Art Editors
IRENE KASNER, Editorial Service

Resident Editors

New York 17 .....60 E. 42nd St.
B. K. PRICE, L. E. BROWNE
STANLEY B. STEWART
Murray Hill 2-2581

Chicago 11 .....520 N. Michigan Ave.
ERLE F. ROSS, WILLIAM E. DEAN
Whitehall 4-1234

Pittsburgh 19 .....2837 Koppers Bldg.
ROBERT M. LOVE, Atlantic 1-3211

Detroit 35 .....15800 W. McNichols Rd.
A. DONALD POSTMA
Broadway 3-8150

Washington 4 ....1123 National Press Bldg.
JOHN R. BOTZUM
Executive 3-6849

London, 2 Caxton St., Westminster S. W. 1
VINCENT DELPORT, European Editor

Editorial Correspondents

Birmingham—Birmingham 3-1121 R. W. KINCEY
Buffalo—Emerson 5385 ....GEORGE E. TOLES
Youngstown—Riverside 7-1471 ..GEO. R. REISS
Los Angeles—Webster 5-3040 NORMAN LYNN
San Francisco—Yukon 6-5151 EDWIN HAVERTY
Seattle—Melrose 1895 .....R. C. HILL
Cincinnati—Beechmont 1-9607....DICK HAVLIN
Toronto, Canada—Empire 4-9655..F. S. TOBIN
Birmingham, England .....J. A. HORTON
Paris, France .....LEON JAUDOIN-PROM
Brussels, Belgium .....PAUL DE KEYSER
Dusseldorf, Germany ....DR. HERBERT GROSS
St. Louis—Parkview 7-8510, MAC L. HUTCHENS

BUSINESS STAFF

Business Manager, D. C. KIEFER

Advertising Director .....H. G. ROWLAND
Advertising Service Mgr. ....DORIS MITCHELL
Production Manager .....A. V. ANDERSON
Classified Advertising .....EVELYN DIETZ
Promotion Director .....S. F. MARINO
Circ. & Research Dir. ....N. R. LADABOUCHE
Circulation Manager .....G. R. EBERSOLE
Reprints .....JUNE SCHILENS

Advertising Representatives

New York 17 .....60 E. 42nd St.
K. A. ZOLLNER, GUY LABAW
Murray Hill 2-2581

Wynnewood, Pa. (Phila.) 200 Wynnewood Ave.
WM. J. VERSCHOOR—Midway 2-6512

Farmington, Conn. .....12 Farmstead Lane
CALVIN FISHER JR.—Orchard 7-1756

E. Rochester, N. Y. ....217 Ridgeview Dr.
HAROLD A. DENNIS—Browning 2105

Pittsburgh 19 .....2837 Koppers Bldg.
J. C. SULLIVAN—Atlantic 1-3211

Cleveland 13 .....Penton Bldg.
J. K. GILLAM, N. W. MANNING
Main 1-8260

Cincinnati 6 .....2215 Victory Pkwy.
E. L. FRANKE—Parkway 1-0711

Detroit 35 .....15800 W. McNichols Rd.
C. A. TALLINGER JR. Broadway 3-8150

Chicago 11 .....520 N. Michigan Ave.
L. C. PELOTT, W. L. POLAND
WM. J. D'ALEXANDER
Whitehall 4-1234

Los Angeles 36 .....5943 W. Colgate Ave.
F. J. FULLER—Webster 1-6865

San Francisco 4 .....57 Post St.
Robert W. Walker Co.—Sutter 1-5568

Griffin, Georgia .....1106 Pine Valley Rd.
FRED J. ALLEN—Griffin 7854

BPA

Published Every Monday By
THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, O.
MAin 1-8260

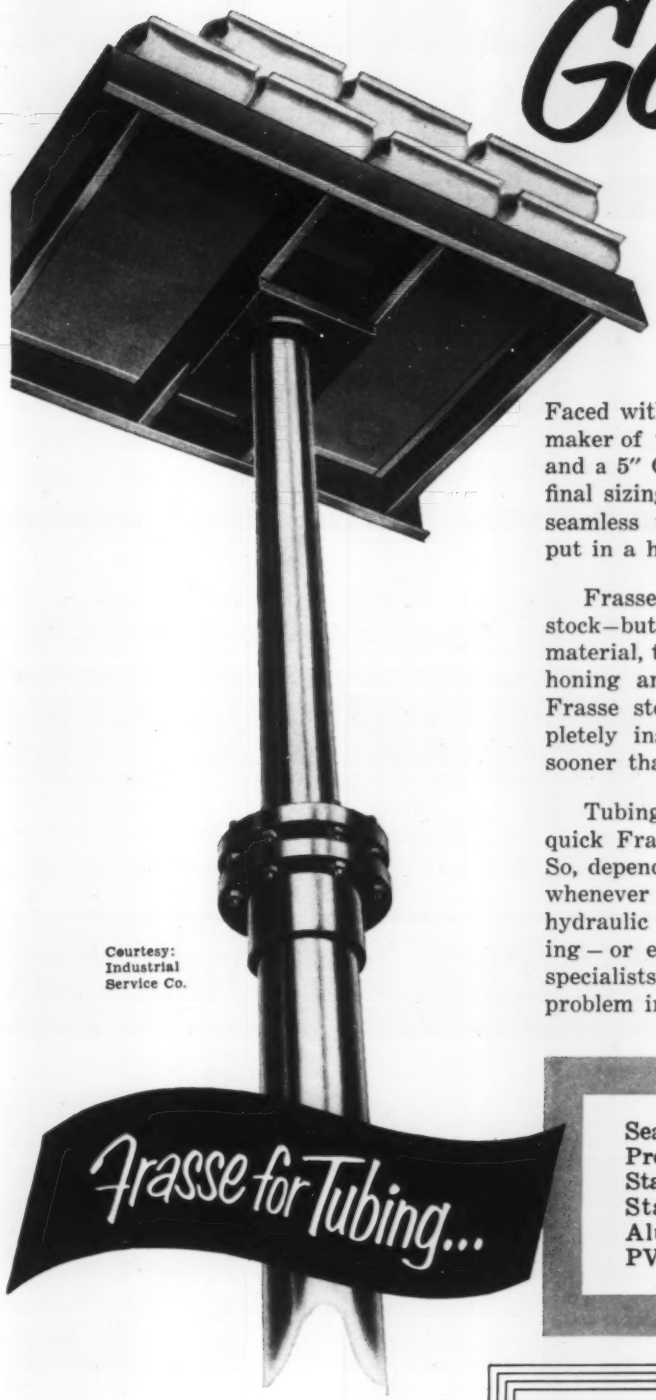
GEORGE O. HAYS .....President
RUSSELL C. JAENKE .....Executive Vice President
FRANK G. STEINEBACH .....Vice President and Secretary
FRANK O. RICE .....Vice President
JOSEPH P. LIPKA .....Treasurer and Assistant Secretary

NBP

Also Publisher of
FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST, AUTOMATION
Member of Business Publications Audit of Circulation Inc., Society of Business Magazine Editors and National Business Publications Inc.

Going up...

with a lift from FRASSE stock tubing!



Courtesy:
Industrial
Service Co.

Faced with an almost impossible delivery deadline, the maker of this hydraulic elevator needed a 6" OD ram and a 5" OD ram to telescope. Then too, he knew that final sizing would consume valuable time. With Shelby seamless tubing specified – and speed essential . . . he put in a hurried call to Frasse.

Frasse not only made delivery *immediately* from stock–but was able to *select*, from commercial tolerance material, two tubes so close to final size that only minor honing and turning were necessary. This lift from Frasse stock tubing enabled the elevator to be completely installed, approved . . . *and in operation*, days sooner than had been anticipated.

Tubing stocks at Frasse are in good supply – and quick Frasse delivery helps you get jobs done faster. So, depend on a dependable tubing source – *call Frasse* whenever you need mechanical tubing, stainless tubing, hydraulic and pressure tubing, centrifugally spun tubing – or even a bit of assistance from Frasse tubing specialists. They'll be happy to work with you on any problem involving a tubular product.

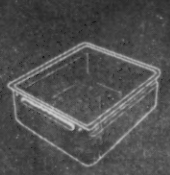
Frasse for Tubing...

Seamless and Welded Mechanical Tubing
Pressure, Condenser and Hydraulic Tubes
Stainless Tubing, Seamless and Welded
Stainless Pipe, Valves and Fittings
Aluminum Tubing, Pipe and Fittings
PVC Plastic Pipe, Valves and Fittings

Peter A. Frasse & Co., Inc.

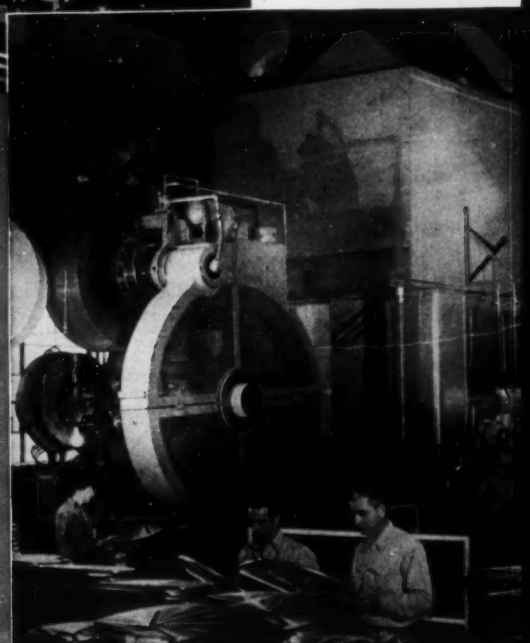
New York 13, N. Y.	Philadelphia 29, Pa.	Buffalo 7, N. Y.	Syracuse 1, N. Y.	Hartford 1, Conn.
17 Grand St.	3911 Wissahickon Ave.	P.O. Box K, Station B	P.O. Box 1267	P.O. Box 1949
WAlker 5-2200	BAldwin 9-9900	BEdford 4700	HOward 3-8655	JAckson 9-6861

LYNDHURST • ROCHESTER • BALTIMORE



THIS ONE MAKES PANS . . . Pans are produced at the rate of ten a minute in this 700-ton seven-station Bliss transfer feed press. A 22" x 24" blank is drawn 5½" deep in the first station; trimming, piercing and restriking operations follow. Pans leave the press completely finished — ready for pickling and enameling.

THESE TWO MAKE SHELVES . . . "Lazy Suzan" shelves by the millions are the product of these two 800-ton Bliss transfer feed presses and the two Bliss embossing presses stationed at their output ends. Coil stock is blanked in the first stations of the presses and work pieces carry through the remaining five stations and into the embossing press automatically. Each press produces 15 shelves per minute through two shifts.



BLISS TRANSFER FEED PRESSES STEP UP GE REFRIGERATOR PRODUCTION

They make all the pans and all the shelves GE needs for its annual output of more than half a million refrigerators!

Here's what's happening at Appliance Park: 6000-pound coils of steel feed into one end of these Bliss transfer feed presses, lines of shelves and pans march out the other ends, and only a few attendants stand by in between.

Three separate press lines are involved. One is a 700-ton, seven-station press (with coil cradle, straightener and roll feed) that produces ten deep-drawn pans a minute.

The other two — identical set-ups — are 800-ton, six-station presses, also with cradle, straightener and feed, which feed into 800-ton embossing presses (see photo). Each produces shelves at the rate of 15 per minute.

The method of operation is the same for all. Mill coils are loaded on the cradle. From there, strip feeds through the straightener and into the roll feed. At the first die station in the press a blank is cut off. The transfer feed fingers move in on the work piece and carry it to the next station. As the slide comes down, the fingers move out; as it rises, they move in and repeat the cycle. New strip is brought to the first station and a completed part delivered with every stroke of the press.

This set-up has solved a number of knotty problems for General Electric. Previously production required the services of two or three vendors, doubling and tripling the cost of dies and labor. Still further savings have come from the use of standard mill coils instead of blanks. In fact, the savings are expected to bring about an early amortization of the entire installation.

Bliss has been building transfer feed presses and systems like this since Spanish-American War days; today, over a thousand are in use. If you're faced with long-run production problems, let a Bliss engineer show you some typical uses of the transfer feed principle. Perhaps it can pull your production costs into line — as it has for so many others.

SEE IT IN ACTION . . . *A new color-and-sound movie takes viewers to the plant, shows the press in action. See close-ups of tooling, of transfer fingers, of coil feed techniques. To arrange a showing at your plant, write to E. W. Bliss Company, Canton, Ohio, or see your local Bliss representative.*

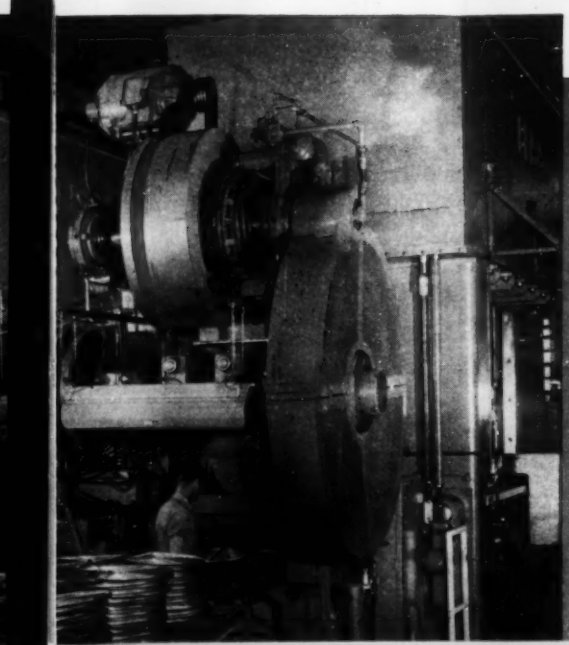
BLISS
SINCE 1857

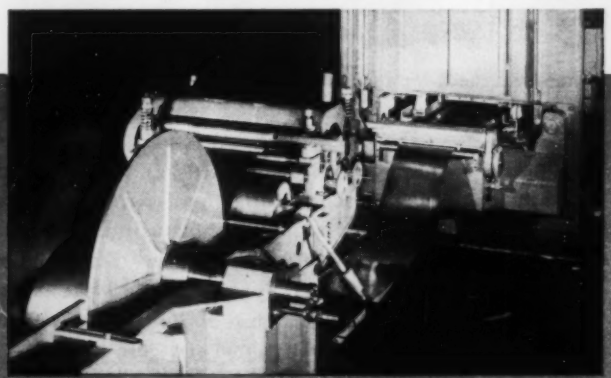
E. W. BLISS Company, Canton, Ohio

PRESSES, ROLLING MILLS, SPECIAL MACHINERY

is more than a name . . . it's a guarantee

U. S. Plants in Canton, Cleveland, Salem and Toledo, Ohio; Detroit and Hastings, Michigan; Midland and Pittsburgh, Pa.; San Jose, Calif. *Branch Offices in* Burbank, Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, San Jose, Salem, Toledo, Washington, D. C.; and Toronto, Ontario, Canada; E. W. Bliss (England) Ltd., Derby; E. W. Bliss Co. (Paris), France. *Other representatives throughout the world.*





ALL THREE LINES WORK FROM COIL STOCK . . . A number of handling operations are eliminated because, on each of the three presses, strip from standard-sized mill coils are fed from this power coil cradle through a five-roll straightener and into the roll feed on the press. Blank is cut off in the first die station of the press. Though not shown here, a second coil is ordinarily held ready at the rear of the cradle to speed handling. Bliss engineers designed all the coil handling equipment and all of the tooling for each of the presses.

One of these Monarch casting methods offers you

MORE CASTING VALUE PER DOLLAR

When you check Monarch's non-competitive casting analysis, every phase of production, including machining, finishing and assembly, is properly evaluated. Monarch mass-produces castings by all three methods, with more than 20 years experience. Monarch operates the largest finishing department of any commercial foundry. This broad manufacturing experience assures you "non-competitive", unbiased answers to the manufacturing problems of your end-product—and more casting value per dollar. Consult Monarch today for improving end-product performance at lower factual end-cost.

- *Aluminum permanent mold fry-pan, cast in heating element, colorful Spectraglaze® porcelain enamel finish.*
- *Certified zinc electronic housing, as cast, commercial trimmed.*
- *Aluminum die cast portable tool, mar-resistant Velvaglaze® finish.*

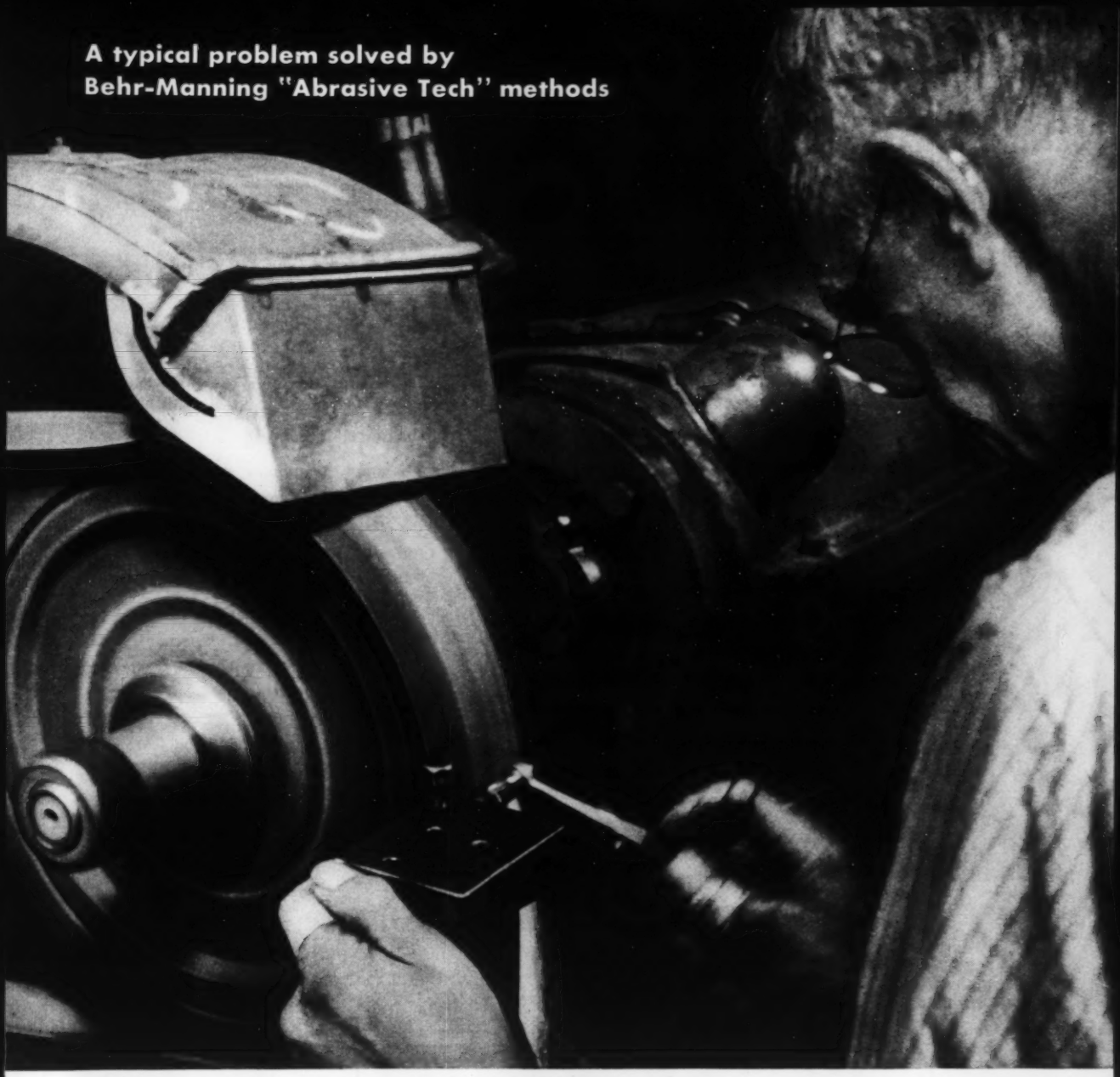
SINCE 1913
MONARCH
ALUMINUM
PIONEERS IN CASTING PROGRESS

® Velvaglaze and Spectraglaze are Trade Marks of

MONARCH ALUMINUM MFG. COMPANY—9205 DETROIT AVENUE—CLEVELAND 2, OHIO—OLympic 1-1700

MANUFACTURERS OF: *Aluminum Permanent Mold Castings • Zinc Die Castings • Aluminum Die Castings • Exclusive Velvaglaze Finishing • and Spectraglaze, colorful Porcelain Enamel on Aluminum Permanent Mold Castings.*

A typical problem solved by
Behr-Manning "Abrasive Tech" methods



Here's how production jumped 23%: The outside diameter of the box end of this wrench is being polished with a simple fixture and one pass on a Metalite coated abrasive belt. The result of this "Abrasive Tech" method is fast, consistent polishing, since rotation and pressure of the wrench against the belt are always uniform.

Very often a Behr-Manning methods engineer can provide a helping hand with different finishing problems. Just call the nearest Behr-Manning office for a date. There are 17 well-equipped "Abrasive Tech" Methods Rooms, available for problem-solving, or helping finishers brush up on new techniques: Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Grand Rapids, High Point, Indianapolis, Los Angeles, Teterboro, Camden, San Francisco, Seattle, St. Louis, and Brantford, Canada. Main office and plant, Troy, N. Y. For Export: Norton Behr-Manning Overseas, Inc., Troy, N. Y., U.S.A.

BEHR-MANNING CO.

A DIVISION OF NORTON COMPANY

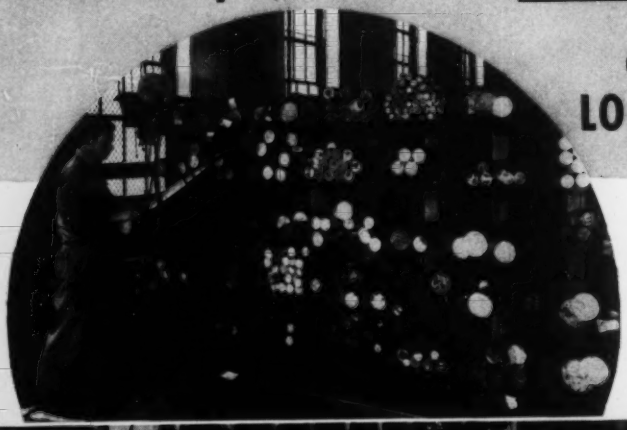
NORTON ABRASIVES

BEHR-MANNING PRODUCTS: Coated Abrasives • Sharpening Stones • Behr-cat Tapes
NORTON PRODUCTS: Abrasives • Grinding Wheels • Grinding Machines • Refractories

BEHR-MANNING®

For dependable SAME DAY Service

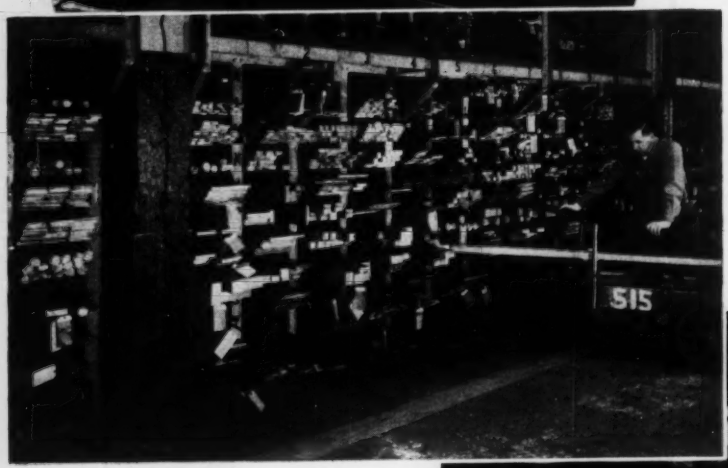
Call your LOCAL STEEL DISTRIBUTOR

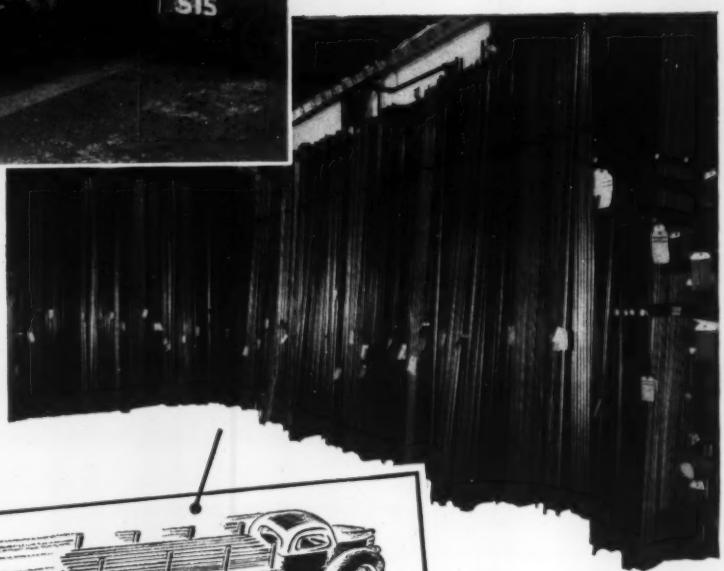


He is ready to serve you on a moment's notice . . . to help you keep your production line moving.

His ample warehouse stocks provide you with a convenient shopping center for all your steel requirements . . . saving you the expense of carrying heavy inventories.

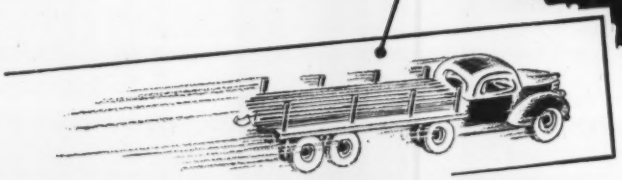
You can buy just what you need:—a few bars or a truckload. Special services are also available to you . . . shearing, flame cutting, sawing to length.





Remember LUSTERIZED FINISH* is available from your local distributor.

This is today's *finest* Cold Drawn Bar Steel—a quality standard, developed exclusively by Bliss & Laughlin, Inc.



TYPICAL WAREHOUSE STOCK OF "LUSTERIZED FINISH"

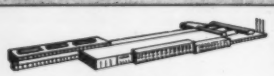
* Reg. Trade-Mark

BLISS & LAUGHLIN, INC.

GENERAL OFFICES: HARVEY, ILLINOIS

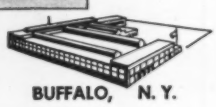
SALES OFFICES IN ALL PRINCIPAL CITIES

FOUR PLANTS:—



HARVEY, ILL.

DETROIT, MICH.



BUFFALO, N. Y.

MANSFIELD, MASS.

CALENDAR
OF MEETINGS

Apr. 8-10, American Institute of Mining, Metallurgical & Petroleum Engineers: Open hearth and blast furnace conference, William Penn hotel, Pittsburgh. Institute's address: 29 W. 39th St., New York 18, N. Y. Secretary: E. O. Kirkendall.

Apr. 8-10, American Society of Mechanical Engineers: Spring meeting, Dinkler-Tutwiler hotel, Birmingham. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

Apr. 8-10, Gas Appliance Manufacturers Association: Annual meeting, Greenbrier, White Sulphur Springs, W. Va. Association's address: 60 E. 42nd St., New York 17, N. Y. Secretary: Harold Massey.

Apr. 8-10, Metal Treating Institute: Spring meeting, Boca Raton hotel and club, Boca Raton, Fla. Institute's address: 271 North Ave., New Rochelle, N. Y. Executive secretary: C. E. Herington.

Apr. 8-12, American Welding Society: Spring technical, national meeting and welding show, Sheraton and Bellevue-Stratford hotels and Convention Hall, Philadelphia. Society's address: 33 W. 39th St., New York 18, N. Y. National secretary: J. G. Magrath.

Apr. 9, Material Handling Institute: Spring membership and directors' meeting, Edgewater Beach hotel, Chicago. Institute's address: One Gateway Center, Pittsburgh 22, Pa. Managing director: R. Kennedy Hanson.

Apr. 10-11, Bituminous Coal Research Inc.: Annual meeting, Greenbrier, White Sulphur Springs, W. Va. Association's address: 803 Southern Bldg., Washington 5, D. C. Secretary: C. A. Reed.

Apr. 10-11, Malleable Founders' Society: Market development conference, Edgewater Beach hotel, Chicago. Society's address: 1800 Union Commerce Bldg., Cleveland 14, O. Managing director: Lowell D. Ryan.

Apr. 15-17, American Society of Lubrication Engineers: Annual meeting and exhibit, Sheraton-Cadillac hotel, Detroit. Society's address: 84 E. Randolph St., Chicago 1, Ill. Administrative secretary: William P. Youngclaus Jr.

Apr. 15-17, Building Research Institute: Annual meeting, Drake hotel, Chicago. Institute's address: 2101 Constitution Ave., Washington 25, D. C. Executive director: W. H. Scheick.

Apr. 23-24, American Institute of Electrical Engineers: Biennial conference on electric heating, Commodore Perry hotel, Toledo, O. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Apr. 23-25, Grinding Wheel Institute and Abrasive Grain Association: Spring meeting, Homestead, Hot Springs, Va. Information: Hunter-Thomas Associates, 2130 Keith Bldg., Cleveland 15, O.

Apr. 23-26, Steel Shipping Containers Institute Inc.: Annual meeting, Palm Beach Biltmore hotel, Palm Beach, Fla. Institute's address: 600 Fifth Ave., New York 20, N. Y. Secretary: L. B. Miller.

Apr. 24-25, National Industrial Research Conference: Conrad Hilton hotel, Chicago. Sponsor: Armour Research Foundation, Illinois Institute of Technology, 35 W. 33rd St., Chicago 16, Ill.

Apr. 24-26, American Zinc Institute and Lead Industries Association: Joint annual meeting, Drake hotel, Chicago. Information: 60 E. 42nd St., New York 17, N. Y. Secretary: Robert L. Ziegfeld.

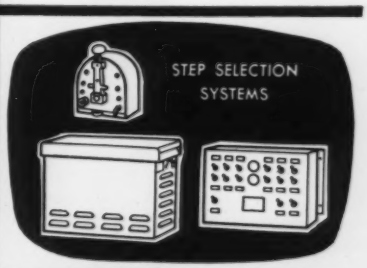
Apr. 25-26, American Society of Mechanical Engineers and Society for Advancement of Management: Annual management engineering conference, Hotel Statler, New York. Society's address: 74 Fifth Ave., New York 11, N. Y. Executive vice president: Harold R. Bixler.

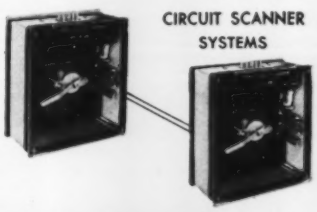
Femco

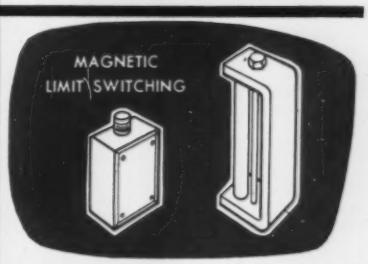
CONTROL SYSTEMS

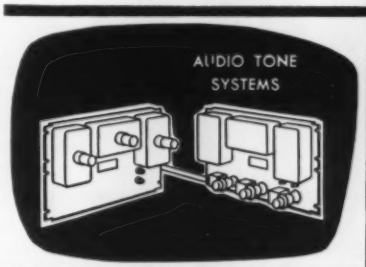
FOR MODERN INDUSTRY

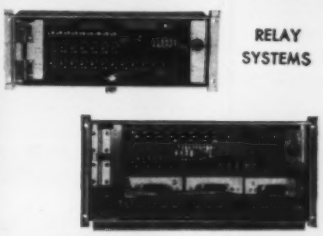
with standard components, we can provide control and indication for many purposes.











Femco Systems use only one pair of wires or operate over existing power lines!

Let a Femco sales engineer help solve your problem.

UNderhill 3-3200 **Femco, Inc.** IRWIN, PA.

COMMUNICATION • Electronic Engineers • AUTOMATION

Hard-Facing Gives This Valve Part A Longer Life In High-Temperature, High-Pressure Service.

Mechanization Speeds Production . . .

Cuts Cost of Hard-Facing by 40%

Valve parts hard-faced with HAYNES STELLITE alloy No. 6 have unusual resistance to oxidation, erosion, seizing and galling, corrosion, and abrasion. They will withstand wear even at elevated temperatures, and operate for long periods of time in high-temperature, high-pressure service.

Reclaiming worn valve parts or protecting new ones by hard-facing has always been an economical practice. Now mechanization has made it even more attractive. Mechanized hard-facing is fast . . . up to four times faster than manual methods. It produces smooth, sound deposits that require less finishing time. And because it provides closer control over the hard-facing operation, less rod and less oxygen and acetylene are consumed.

Haynes Stellite Company designs and produces mechanized equipment for depositing hard-facing rods by the oxy-acetylene process. Machines are available for surfacing flat, longitudinal surfaces; flat, angled or grooved parts; and for handling cylindrically shaped parts. Write to any district office for more information on mechanized equipment and on the 19 HAYNES hard-facing alloys.

HAYNES TRADE-MARK ALLOYS

HAYNES STELLITE COMPANY

A Division of Union Carbide and Carbon Corporation

UCC

General Offices and Works: Kokomo, Indiana

Sales Offices

Chicago • Cleveland • Detroit • Houston • Los Angeles • New York • San Francisco • Tulsa

The terms "Haynes" and "Haynes Stellite" are registered trade-marks of Union Carbide and Carbon Corporation.

UNITED®

6 stand continuous horizontal and vertical Billet Mill

UNITED ENGINEERING AND FOUNDRY COMPANY
Pittsburgh, Pennsylvania

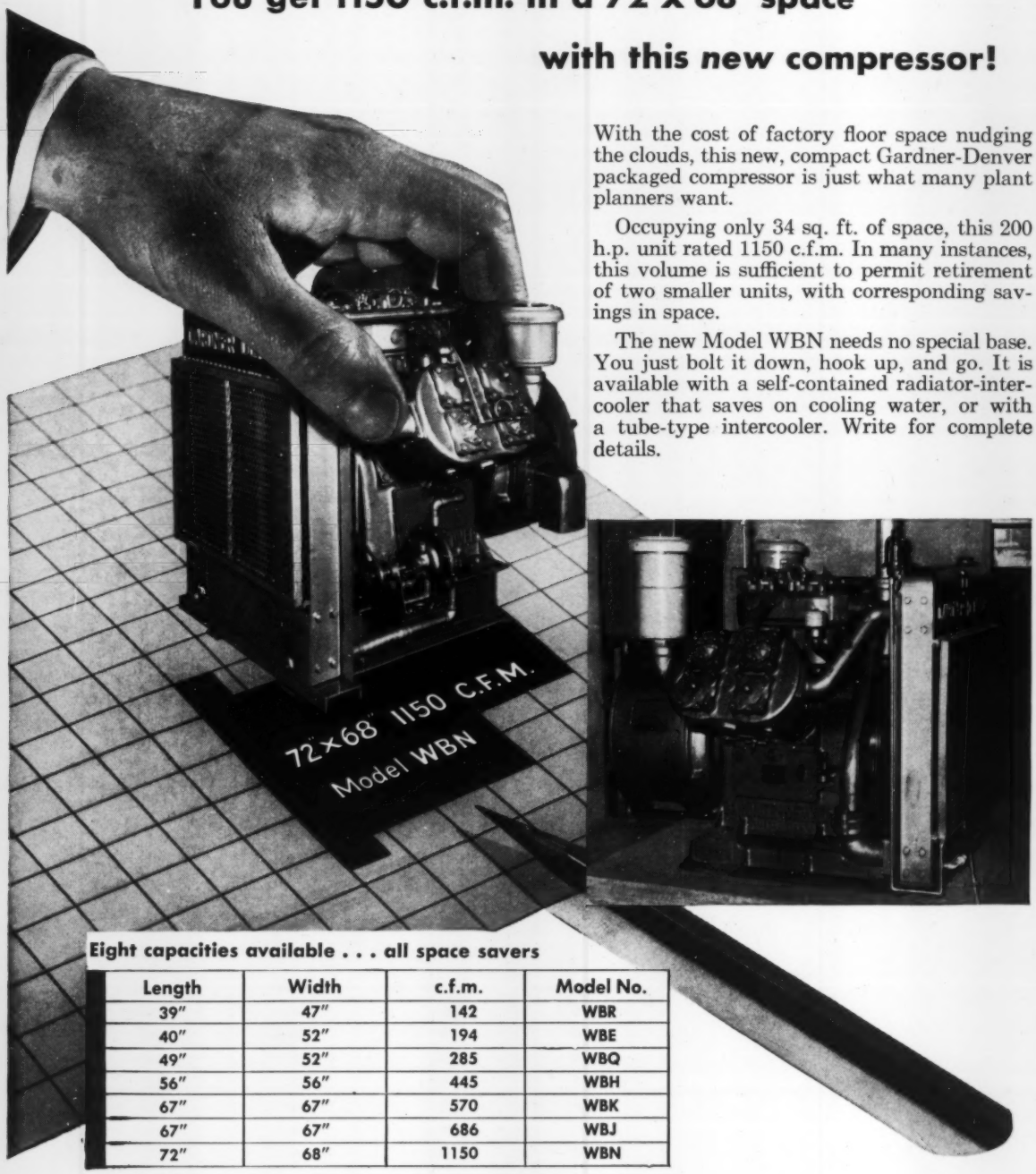
Plants at PITTSBURGH • VANDERGRIFT • YOUNGSTOWN • CANTON • WILMINGTON

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO
STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

Your own plotting will prove it!

You get 1150 c.f.m. in a 72"x 68" space with this *new* compressor!



With the cost of factory floor space nudging the clouds, this new, compact Gardner-Denver packaged compressor is just what many plant planners want.

Occupying only 34 sq. ft. of space, this 200 h.p. unit rated 1150 c.f.m. In many instances, this volume is sufficient to permit retirement of two smaller units, with corresponding savings in space.

The new Model WBN needs no special base. You just bolt it down, hook up, and go. It is available with a self-contained radiator-intercooler that saves on cooling water, or with a tube-type intercooler. Write for complete details.

Eight capacities available . . . all space savers

Length	Width	c.f.m.	Model No.
39"	47"	142	WBR
40"	52"	194	WBE
49"	52"	285	WBQ
56"	56"	445	WBH
67"	67"	570	WBK
67"	67"	686	WBJ
72"	68"	1150	WBN

ENGINEERING FORESIGHT — PROVED ON THE JOB
IN GENERAL INDUSTRY, CONSTRUCTION, PETROLEUM AND MINING

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

BUY PROFIT IN ALCO CIRCULAR FORGINGS

Hi-Qua-Led* Steel forgings, available in any AISI Open Hearth Grade, can reduce machining time more than half, or increase tool life up to 1600 per cent. ALCO's experience and equipment build cost-reducing uniformity into standard circular forgings from 18- to 145-in. OD.

The big news is Hi-Qua-Led Steel. It was developed by ALCO to lower your machining costs on circular forgings — particularly in applications where a lot of metal must be removed. So far, customers using Hi-Qua-Led Steel forgings have reported as high as 69 per cent improvement in turning time, 41.2 per cent in teeth-cutting time. Hobbing tool life has been increased up to 1600 per cent. Even surface finish has been improved markedly.

There is no change in steel properties in Hi-Qua-Led Steel. It can be expected to perform exactly like a regular steel in the same grade. Customers report same response to heat treatment as regular steels.

You can profitably use Hi-Qua-Led Steel forgings if you put four or more hours machining into a circular forged piece, or if you do hobbing or other tough machining jobs with expensive tools. If your machining is not extensive, ALCO's regular circular forgings can still save you money with their high uniformity and exact conformance to your specifications.

We'd like you to have full information. Your nearest ALCO sales office will be happy to provide it, or, if you wish, you can receive complete explanatory information in Bulletins SF-1 and SF-2 by writing Spring & Forge Division, Dept. OCF-1, P.O. Box 1065, Schenectady 1, New York.

**Trademark reg. applied for. Patent applied for on lead-addition method.*

ALCO

ALCO PRODUCTS, INC.

NEW YORK

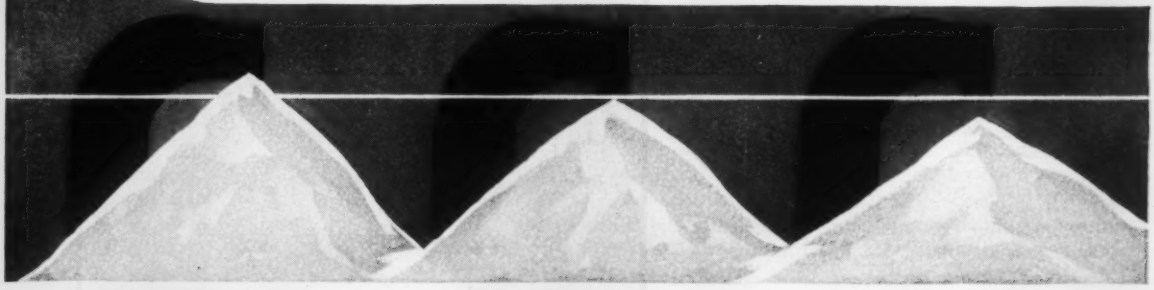
Sales Offices in Principal Cities

Locomotives · Diesel Engines · Nuclear Reactors · Heat Exchangers · Springs · Steel Pipe · Forgings · Weldments · Oil-Field Equipment

Now in Production...

3 NEW REPUBLIC IRON POWDERS

...WITH Controlled dimensional factor



TYPE "G" TYPE "N" TYPE "S"

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

To meet the varied requirements of industry, Republic's Metal Powder Division has developed and is producing three new grades of iron powder suitable for the molding and manufacture of mechanical parts.

Each one of these new powders has a variable controlled characteristic known as *Controlled Dimensional Factor.* This term simply means that in the presence of copper, Republic Iron Powder—depending on type—can be made to grow, remain stable, or shrink, within acceptable limits. These new powders have been designated as:

TYPE "G" FOR GROWTH—A powder having a definite growth-characteristic in the presence of copper, and developed for use in many *existing* dies designed for powder which expands when sintered.

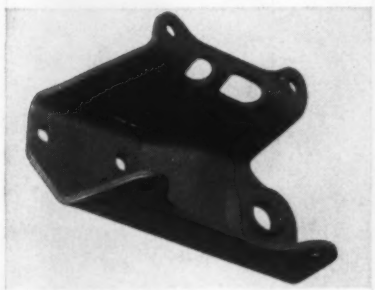
TYPE "N" FOR NORMAL—This powder has been given normal variation in dimensional change from a slight shrinkage to a slight growth, depending upon the end-result required.

TYPE "S" FOR SHRINKAGE—A powder with an extremely high shrinkage-characteristic which can be used to attain certain tensile strengths with lesser quantities of copper.

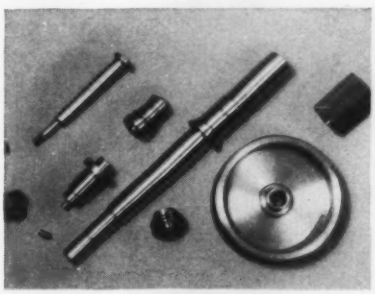
Both "S" and "N" powders should prove exceptionally advantageous to parts producers faced with the problem of what to do with dies that have become oversize through wear. Types "S" and "N" make possible the production of parts to original dimensions without the need for extensive or expensive re-working of dies.

Controlled Dimensional Factor is an exclusive Republic development retaining the excellent chemistry and high green strength always associated with Republic Iron Powder.

For complete information on chemical composition, physical properties and test evaluations, write for Republic Booklet Adv. 763.



PRODUCTION FACILITIES, plus complete design and engineering service, go to work for you as an extension of your plant, when you have stamped and drawn parts fabricated by Republic's Pressed Steel Division. One example of a wide variety of steel parts mass-produced to specification, at the lowest possible cost, is the truck-shaft bracket shown above. Write for Booklet Adv. 681.



PRODUCTION OF PRECISION PARTS at higher speeds and feeds with fine finished surfaces and longer tool life, is made possible by the use of Republic Cold Finished Steels. Republic offers you a complete range of carbon, alloy, and stainless analyses drawn to precise size and cross section. Mail the coupon today for complete information on Republic Cold Finished Steels.

PRODUCTION OF BUILT-UP, INTERLOCKING OR ASSOCIATED PARTS is greatly simplified by the use of Republic Cold Drawn Special Sections. Machining time and costs are reduced to a minimum because the sections are preformed to the predominating cross section of the part. Cold drawing also improves physical properties in the parts. Available in all grades of carbon, alloy and stainless steel. Send coupon for more data.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
Dept. C-3467
3120 East 45th St., Cleveland 27, Ohio

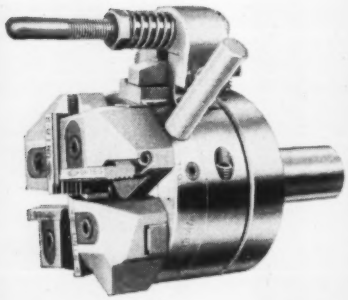
Please send more information on these Republic products:
- ☐ Iron Powder (Booklet Adv. 763)
- ☐ Stampings (Booklet Adv. 681)
- ☐ Cold Finished Steels
- ☐ Special Sections

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____



LARGE DIAMETER THREADING

on a Brown & Sharpe Automatic

Pol nuts for gas cylinders, requiring both 1⅛" and .880" diameter threads, are threaded at the Fisher Governor Co. (Marshalltown, Iowa) on a B & S Automatic using the 5 EXX LANDMATIC Head.

The EXX LANDMATIC is a compact stationary die head designed for threading operations on small screw machines. It uses tangential chasers and is built in two sizes—the ½" for No. 0 and No. 2 B & S machines with a range from #4 to ½"—and the ⅝" for No. 2 B & S machines with a standard range of #4 to ⅝". The ⅝" model can be equipped with oversize chaser holders, as shown here at Fisher Governor.

The special diameter (.880") threading operation is illustrated with a workpiece of ASTM-B16-Brass (65-80 Rockwell B). A 14 pitch UN thread has just been cut $1\frac{7}{32}$" long to within .140" of the shoulder (held to .0036" on the pitch diameter). Threading at 450 RPM, approximately 150,000 pieces are completed between chaser grinds. This same head, with proper chasers and chaser holders, is used to produce 1⅛" diameter 16 pitch threads $1\frac{3}{16}$" long.

The EXX Head features an adjustable spring mechanism which allows compensation of cam feed lead for threads of different pitches. Through this device the die head can be adjusted for the correct amount of pressure for the pitch of the thread to be cut. Another important feature is the external tripping mechanism which prevents premature head opening due to rapid turret indexing. These EXX Heads also offer important economies through the use of LANDIS Tangential Chasers: minimum tool inventory—the same chasers will thread all diameters of the same pitch and form; low tool cost—chasers are usable for 80% of their original length, and can be replaced or reground singly as required.

For detailed information and specifications on the EXX or other LANDIS Die Heads please ask for Bulletins F-80 and F-90.

THE WORLD'S LARGEST MANUFACTURER OF THREADING EQUIPMENT - CUTTING - TAPPING - GRINDING - ROLLING

LANDIS Machine COMPANY

WAYNESBORO • PENNSYLVANIA • U. S. A.

458C

Designing a new wire product?

Call American Steel & Wire!

Steel wire comes in so many different grades, shapes and finishes that it isn't easy to keep them all at your fingertips.

For this reason, we suggest that you give your American Steel & Wire representative a chance to help with new designs while they are still on the drawing board. He may be able to suggest 1) a more economical wire, 2) a wire that will fabricate more easily or 3) a slight design change that will simplify production or lower the cost of the raw material.

At AS&W, we *use* a lot of wire in our own plants; and have learned many little tricks that are yours for the asking. Just call your American Steel & Wire representative.

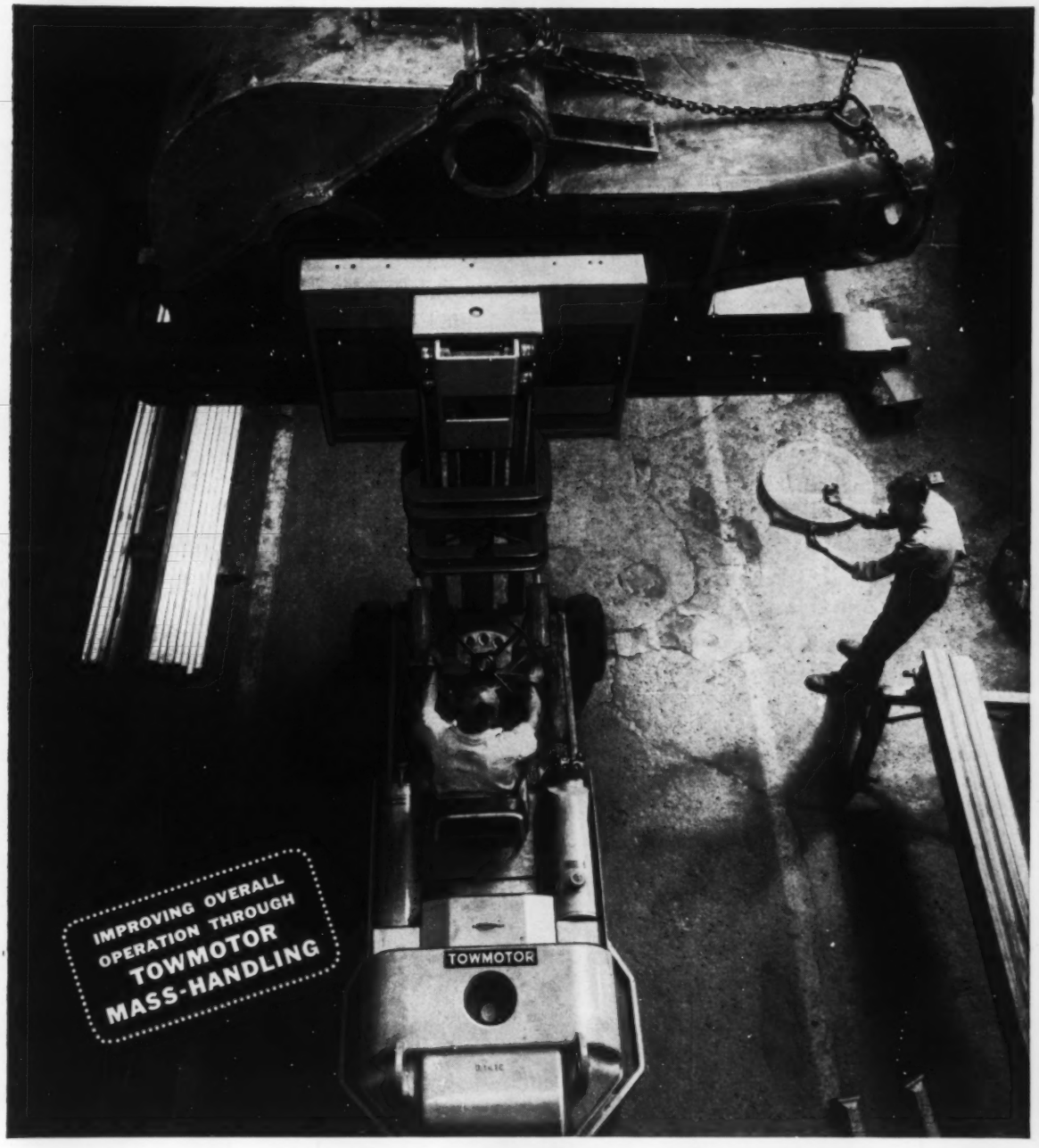
AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS AMERICAN MANUFACTURERS WIRE

USS

AMERFINE—*high quality fine wire.*
AMERSPRING—*music steel spring wire.*
AMERTEMP—*heavy-duty oil-tempered wire.*
AMERLOY—*alloy heading wire.*
AMERHEAD—*uniform heading wire.*
AMERSTITCH—*extra-tough metal stitching wire.*

UNITED STATES STEEL



...increasing productivity without adding personnel!

Management men in every industry are giving productivity and profits—*as well as personnel*—a lift by integrating Towmotor mass-handling in all operations from receiving to delivery.

Every department benefits. More work gets done. And you don't need more men to do it because Towmotor fork lift truck operators are finding it's *fun* to multiply the handling of materials aided by 12 new Towmotor improvements like these:

- New functional body styling
- New pace-setting comfort features
- New "tight-spot" maneuverability
- New centralized easy-reach controls
- New positive-response hydraulic lift
- Towmotor-improved power steering

Some of the industry's most significant advances in fork lift truck design and performance are shown in Towmotor's latest bulletin #SP-23. See how they help supplement your personnel—permit your men to do a bigger day's work easier—give each operator the power to improve your plant's productivity and profits.

Write Towmotor Corporation, Cleveland 10, Ohio. We'll send the illustrated booklet immediately.

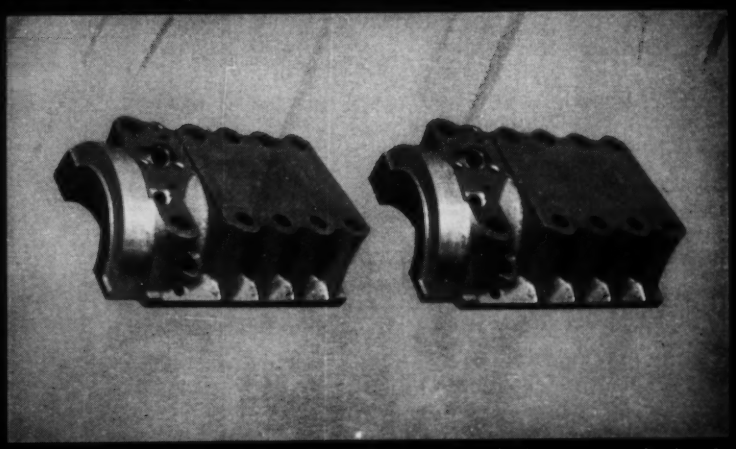
Leaders for 38 years in building Fork Lift Trucks and Tractors

TOWMOTOR THE ONE-MAN-GANG ® -GERLINGER

Gerlinger Carrier Company, Dallas, Oregon is a subsidiary of Towmotor Corporation, Cleveland, Ohio

THREE NEW DEVELOPMENTS
Increase Production

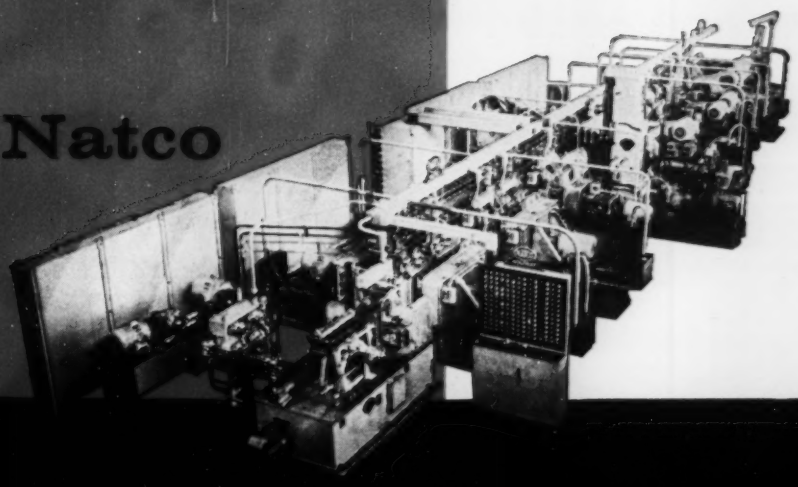
2-at-a-time processing



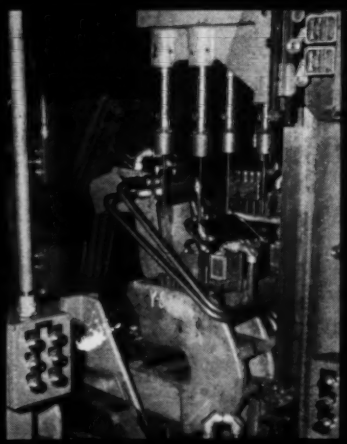
300 HP Natco greatly increases production by processing two complete sets of bearing caps at once.

Bearing caps—240 *sets* per hour—six times the production rate of the machine replaced! This new Natco processes two complete sets at once. It loads surface-broached castings automatically, performs 80 machining operations, places matched sets of finished bearing caps on the assembly conveyor. In addition to broaching and sawing, this 300 HP, 27-station Natco, drills, reams taps, turns, mills, probes and faces.

help this Natco 600%

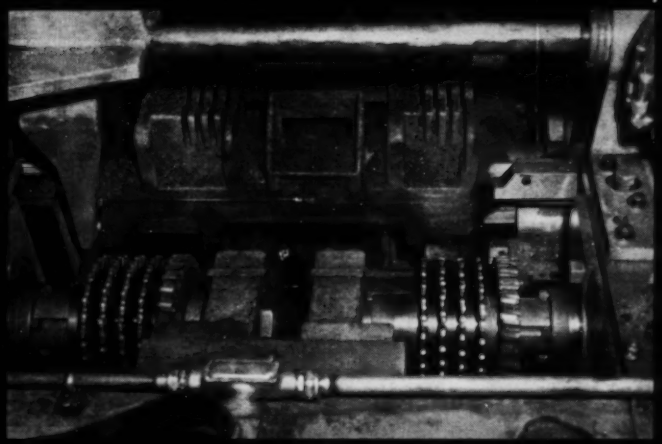


Unique Broaching Station



Fully automatic broaching station eliminates need for withdrawing broaching tools after cut. Broaching tools are pulled completely through hole, removing .030" stock.

New Rigid Saw Station



80 HP sawing station cuts two castings into complete sets of 5 caps each. All surfaces parallel within .0015". Fixture feeds castings into stationary mounted saws, providing rigidity for accurate 14 ipm cutting.

Whatever your high production problem, our engineers will work closely with your people to develop exactly the method and the machine to do your job best. Besides special way-type, index and transfer machines, Natco also builds multiple drilling, boring, facing and tapping machines. Call your nearest Natco office in Chicago, Detroit, Buffalo, New York, Boston, Philadelphia, Cleveland and Los Angeles. Distributors in other cities.

Partners in Production

NATCO

NATIONAL AUTOMATIC TOOL COMPANY, INC. *Richmond, Ind.*

Ask for information about the PAYD (Pay-As-You-Depreciate) Finance Plan

"Teeth Don't Strip on This
"Best for General Cutting"

SIMONDS WAVY SET BAND SAW BLADE

If you cut pipe, angle iron, channel, I-beam, bars, etc. — here's the blade to use because it can handle all types of cutting. It's designed especially for general purpose use.

Note that the teeth are *wavy* set (set in groups) as shown at left. This distributes strain over more teeth and makes it possible to cut all sizes, shapes and types of material *without stripping the teeth.* Fast and smooth cutting, it stands more abuse, lasts longer, cuts costs.

This general purpose blade is made of tough, wear-resistant alloy steel and is available in a variety of widths and tooth spacings. It will pay you to try SIMONDS Wavy Set Blade for *your* general purpose cut-off work.

QUICK FACTS

- Cuts all shapes and types of materials

- Saves changing saws — one saw can do the work of several
- Longer life — cuts blade costs
- Withstands abuse
- Furnished in 100 and 250' Coils or Welded-to-Length for Specific Machines

WAVY SET BAND SAW BLADE SIZES

Width Inches	Thickness	Teeth per Inch
½	.025	10-14-24
⅝	.032	10-14
¾	.032	8-10-14-18
1	.035	10

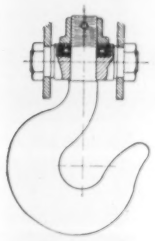
For Fast Service from Complete Stocks Call your SIMONDS Industrial Supply DISTRIBUTOR

125 years of growth 1832-1957

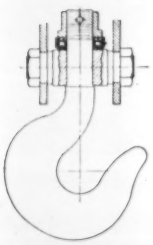
SIMONDS SAW AND STEEL CO.
FITCHBURG, MASS.

Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon, Canadian Factory in Montreal, Que., Simonds Divisions: Simonds Steel Mill, Lockport, N. Y., Heller Tool Co., Newcomerstown, Ohio, Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada

New bulletin shows latest R.B.E.C.* tables for crane hook bearings . . .



Rollway Type CT Crane Hook Thrust Bearing



Rollway Type WCT Crane Hook Thrust Bearing

Reflecting the newest standards for the selection of crane hook bearings, the tables contained in this Rollway bulletin are founded on *basic static load ratings*.

This approach takes into account the ability of Rollway-built rollers and plates to recover from temporary deformation due to static loading, as soon as the bearing starts to rotate.

Actual bearing capacities of Rollway Crane Hook Bearings are *higher* than those given in the tables, because in most crane-hook applications the bearing is operating under slow speed conditions.

Crowned Rollers Provide Even Load Distribution

The crowned rollers used in Rollway Crane Hook Bearings eliminate the harmful effects of corner loading of rollers. Weight is distributed evenly along the full line of contact between roller and plate. Starting torque is reduced by as much as 25% as compared to straight rollers!

* Roller Bearing Engineers' Committee of the Anti-Friction Bearing Manufacturers' Association

Rollube Retainer Resists Wear

All Rollway Crane Hook Bearings feature the new Rollube Retainer, made of ferrous material with corrosion resistant finish. Wear properties are excellent even under adverse lubricant conditions.

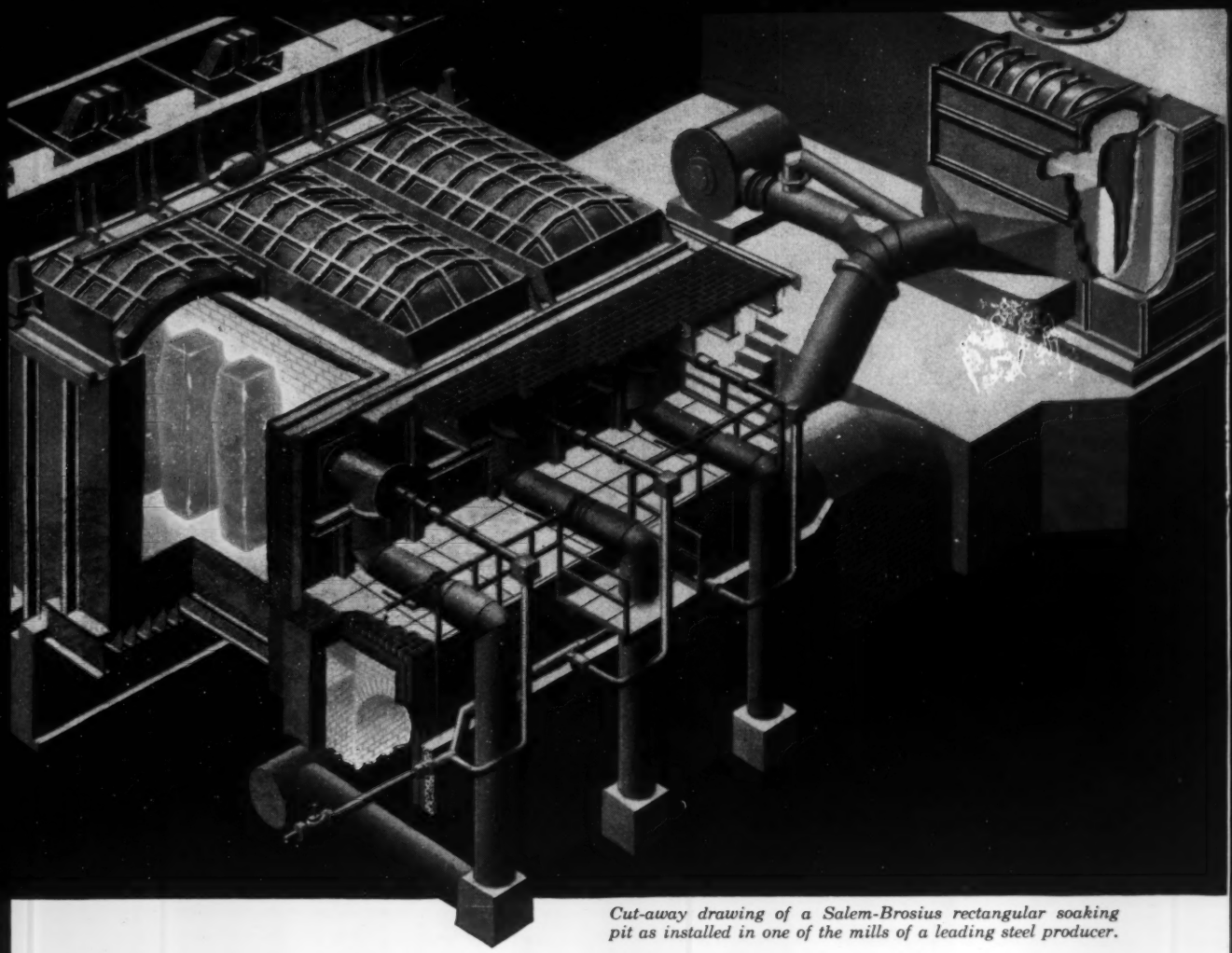
• For full information on the R.B.E.C. tables and Rollway Crane Hook Bearings, send coupon below.

ROLLWAY®
BEARINGS
COMPLETE LINE OF RADIAL AND THRUST CYLINDRICAL ROLLER BEARINGS

ROLLWAY BEARING CO., INC.
545 Seymour St., Syracuse, N. Y.
Please send your "Crane Hook" Bulletin No. 956.

Name..... Title.....
Firm Name.....
Address.....
City..... Zone.... State.....

ENGINEERING OFFICES: SYRACUSE • BOSTON • CHICAGO • DETROIT • TORONTO • PITTSBURGH • CLEVELAND • MILWAUKEE • SEATTLE • HOUSTON • PHILADELPHIA • LOS ANGELES • SAN FRANCISCO



Cut-away drawing of a Salem-Brosius rectangular soaking pit as installed in one of the mills of a leading steel producer.

Users are the best salesmen of Salem-Brosius soaking pits

"We have again specified Salem-Brosius rectangular soaking pits for our expansion program," reports an operating official of a major steel company using pits installed by several manufacturers. "The previous installation heated more steel ingots ready for rolling with less fuel consumption, less maintenance cost, and better temperature uniformity than any other type of pit in our plant."

Reports like this are typical, not only about these rectangular soaking pits, but all other Salem-Brosius heating and heat-treating furnaces as well. Salem-Brosius engineers, both here and abroad, possess an enviable record for designing furnaces which produce maximum, high-quality output at minimum operating cost. If your expansion or modernization plans call for ingot soaking pits or any other heating or heat-treating furnaces, Salem-Brosius, Inc. would appreciate an inquiry.

SALEM-BROSIUS, INC.

CARNEGIE, PENNSYLVANIA

In Canada: Salem Engineering Limited, 1525 Bloor Street West, Toronto, Ontario

Maximum Automation Potential

PREDICTS BEFORE CAPITAL INVESTMENT

Metal removal costs too high?

Carborundum's new M-A-P Method gives you a chance to compare the advantages of coated abrasives

Maximum Automation Potential is a metal removal prediction method—predicts cost savings and production increases with the use of abrasive belts on your present or planned production operations. M-A-P is a *new* engineering service provided by The Carborundum Company. Now you can *compare* the advantages of using abrasive belts on either heavy metal removal or on the finishing or semi-finishing operations of any component part you manufacture.

M-A-P metal removal recommendations are made for you by Carborundum's coated abrasives engineers at the Carborundum plant. A study is made of your specific operation based on a few simple production facts which you provide and an M-A-P recommendation *is mailed to you* without cost or obligation—gives you the opportunity to *know* what savings can be expected *before* making a material or equipment change.

M-A-P predictions are based on facts accumulated through Carborundum's many years of abrasive experience and the abrasive machinery know-how of its Curtis Machine Division. These abrasive facts have been developed into M-A-P formulas—new positive standards for every factor which enters into grinding metal with abrasive belts.

To determine *your* Maximum Automation Potential with abrasive belts write for the M-A-P Brochure which explains this new service to industry in detail. Address inquiries to: Dept. 42 M-A-P, Senior Coated Abrasives Engineer—

The **CARBORUNDUM** Company

COATED ABRASIVES DIVISION

Niagara Falls, New York

Heavy steel castings move to and from machines in Cargotainers. Able to carry heavy loads like this because of strong steel bar reinforcement engineered in the bases, Cargotainers have a high strength-to-weight ratio.

Cargotainers® . . . triple storage space reduce handling costs and material losses at International Harvester's Milwaukee Works

Three times more storage space . . . materials handling costs down eight cents per hundredweight . . . breakage of sand foundry cores and driers materially reduced . . . safety hazards overcome.

These are the advantages International Harvester has gained at its big Milwaukee Works through the use of strong, sturdy welded mesh Cargotainers made by Pittsburgh Steel Products, a division of Pittsburgh Steel Company.

One of the largest International Harvester Plants, Milwaukee Works, supplies over 8,000 different items to other IH plants which produce Harvester's broad line of farm equipment, tractors, trucks and construction equipment.

The 43-acre plant houses several divisions which produce a variety of items including gray iron castings, diesel injection pumps, gears and sheet metal parts. This diversity of production plus limited space for expansion has created a materials handling situation and an acute awareness of the problem.

Milwaukee Works is one of the few plants its size to compute materials handling costs on a weekly basis. Detailed, all-inclusive, these cost studies enable production executives to detect trouble spots before they develop.

• **Three cost watchers**—Ray Seidens, Materials Handling Engineer; George Pusey, Core Room Superintendent; and George Fleming, Staff Assistant to the Works Manager, are the men who keep the closest check on Cargotainers' performance at Milwaukee Works.

Mr. Fleming feels that proper materials handling is the biggest opportunity a metal-working plant has these days to lower costs.

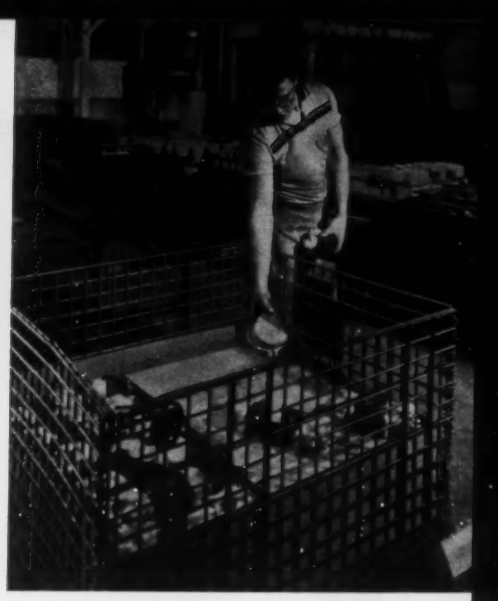
"Any materials handling system," he says, "has to be adaptable to changing production volume. The cost has to be balanced against the production load before you can compute savings. Materials handling is basically a question of economics."

To explain Milwaukee Work's materials handling approach, Mr. Pusey points to experience in their core room.

• **Before Cargotainers,** sand cores were handled on wooden pallets.

(Advertisement)

Easily stacked three-high, Cargotainers protect cores until the foundry needs them. At International Harvester's Milwaukee Works Cargotainers tripled available storage space.



When Cargotainers replaced pallets to move sand cores (above), breakage was cut materially.

Three layers of cores, separated by cardboard, were the maximum load per pallet. They could not be stacked. There was little protection against core slipping off the pallets as they were trucked from the core room some 700 feet to the foundry. When pallets were stored side by side, cores sometimes were rubbed and nicked. This resulted in excess metal on the castings, requiring extra cleaning before the casting could be shipped. The use of Cargotainers solved these problems and helped effect a 6.4 percent reduction in this phase of handling costs in a single year.

• **Cargotainers the answer**—In handling driers Milwaukee Works found that breakage losses were even more pronounced than for the sand cores.

A drier damaged in handling could scrap as many as 10 castings before the damage was detected. When you're talking about castings weighing up to 2,800 pounds, the damaged drier might be scrapping hundreds of dollars worth of castings in a single day.

In another unit, standard wooden boxes were used before Cargotainers came on the scene. The boxes weighed 210 pounds each and had 19.8 cubic feet of storage space. Comparably sized standard Cargotainers—made of tough reinforced welded steel wire fabric on two-inch centers—provided 26.6 cubic feet, at approximately same tare weight per container. In other words, lift trucks carry 6.8 cubic feet more material in each Cargotainer than in wooden boxes.

Cargotainers, because of their sturdy, clearview steel base construction reinforced with ¼" bars, can easily be stacked three high, with safety. Since loaded pallets can't be stacked, three Cargotainers are placed in the space one pallet required.

• **In your plant**—Harvester's Milwaukee Works experience with Cargotainers is being duplicated in hundreds of plants in a variety of American industries. Whether efficient, safe and economical materials handling in your plant requires 200 or 2,000 Cargotainers—Pittsburgh Steel Products can serve you.

A national staff of materials handling engineers is available to help survey your materials handling problems and adapt any one of the dozens of standard Cargotainers to your operation. Contact one of the offices listed below for information.

Cargotainers give radiator tops full protection in storage and transit.

Cargotainers®

by Pittsburgh Steel Products

a division of Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta	Columbus	Detroit	New York	Tulsa
Chicago	Dallas	Houston	Philadelphia	Warren, Ohio
Cleveland	Dayton	Los Angeles	Pittsburgh	

(Advertisement)

Companion machines that help each other and can help you!

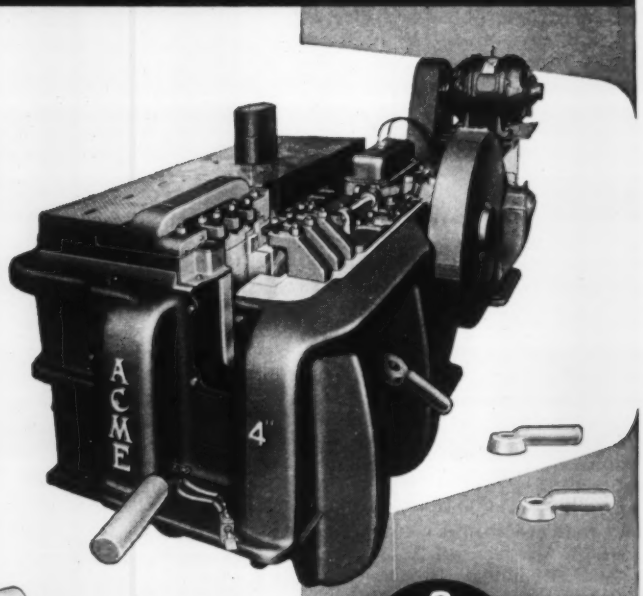
HILL ACME No. 700 BAR-BILLET shear
(Ask for Bulletin B-B)

HILL ACME BAR-BILLET SHEAR

A totally new conception of efficiency in clean, square cuts on bars or billets. Now proven in operation throughout the country. Made in several sizes for cutting stock from 1" to 6" in diameter.

ACME XN FORGING MACHINE

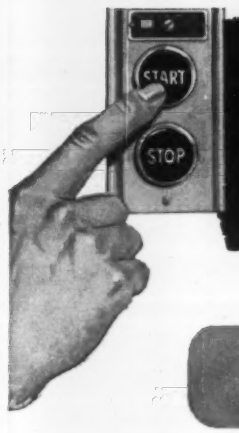
The new, improved ACME XN Forging Machine with its massive, sturdy construction is built to withstand the destructive influences present in all forging machine operations. ACME XN Forging Machines will keep going for long uninterrupted periods, producing accurate, clean forgings at a rate never thought possible a few years ago. A bulletin describing details plus a series of 18 technical articles on modern forging practice will be sent upon request.



The HILL ACME Company

1207 W. 65th STREET • CLEVELAND 2, OHIO

Manufacturers of: "ACME" FORGING • THREADING • TAPPING MACHINES • "CANTON" ALLIGATOR SHEARS • BAR-BILLET SHEARS
"HILL" GRINDING & POLISHING MACHINES • HYDRAULIC SURFACE GRINDERS • "CLEVELAND" KNIVES • SHEAR BLADES



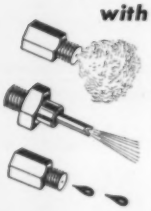
"CLICK" lubrication starts when your machines start!

ALEMITE OIL-MIST AUTOMATIC LUBRICATION

provides constant, uniform, foolproof lubrication— at savings up to 90%!

Alemite Oil-Mist *atomizes* oil into tiny, airborne particles that are distributed to bearings through tubing. It bathes all bearings with a cool film of clean oil . . . maintains uniform oil film regardless of variations in loads, temperature and speed. Simple, continuous, fully automatic. Eliminates the waste and uncertainties of the "human element" in lubrication. Uses up to *90% less lubricant* than ordinary lubrication methods!

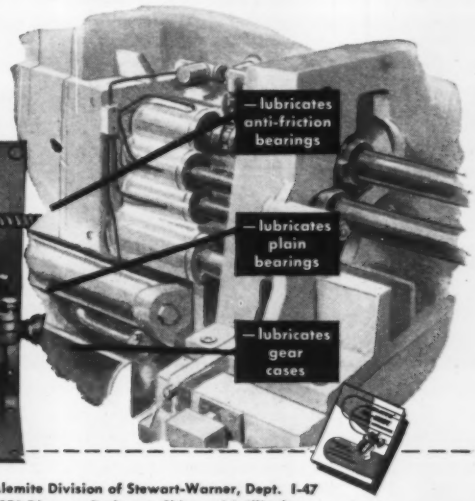
Lubricates any bearing on any machine with one of three types of fittings:



Mist fittings for roller, ball, needle—or any anti-friction type of bearings.

Spray fittings for open and enclosed gears and chains.

Condensing fittings for plain bearings, slides, ways, vees, cams, and rollers.



8 Advantages of the Alemite Oil-Mist System

1. Continuous lubrication. Deposits fresh, clean film of oil on all surfaces of all bearings.

2. Fully automatic. Starts and stops with operation of machine switch.

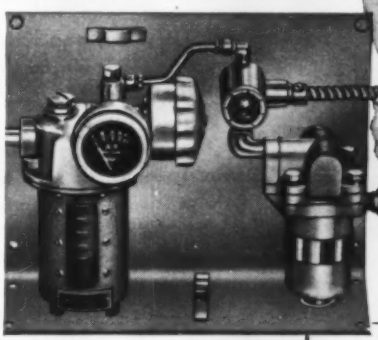
3. No guesswork. Bearings can't be overlooked, or over-lubricated!

4. Reduction of bearing temperatures. Acts as bearing coolant. Reduces bearing temperatures as much as 20°F.

5. Fewer types of oil. Reduces number of oils that must be stocked, handled and applied.

6. Elimination of downtime. All bearings are constantly lubricated while machines continue to operate.

7. Extension of bearing life. Life of grinding machine bearings have been extended from 400 to 7,000 hours!



8. As high as 90% less oil consumption. Usually consumes about 1/10th amount used by any other oiling method.

Mail coupon for Oil-Mist demonstration and information

ALEMITE
REG. U. S. PAT. OFF.

Division of STEWART-WARNER CORPORATION

STEWART SW WARNER

Alemite Division of Stewart-Warner, Dept. I-47
1850 Diversey Parkway, Chicago 14, Illinois

☐ Please send me a FREE copy of your new and complete Oil-Mist catalog.

☐ Please have your Alemite Lubrication Representative arrange a no-obligation demonstration.

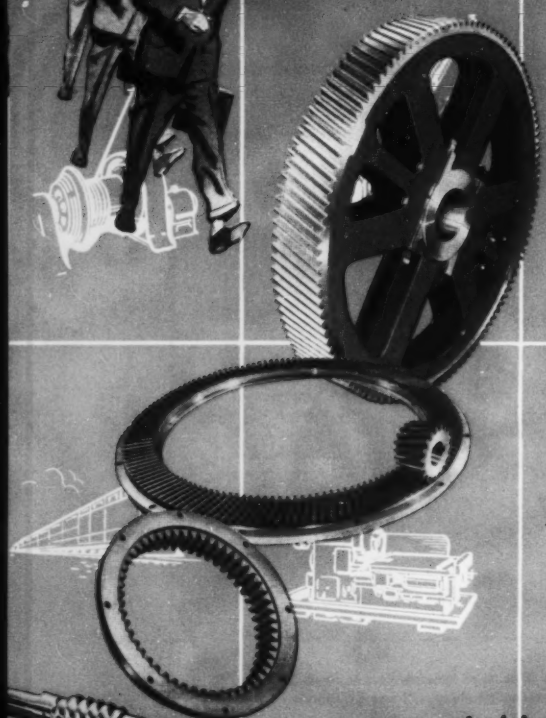
Name .....

Company .....

Address .....

City ..... Zone ..... State .....

...22,461 SALESMEN on the job every day for ILLINOIS GEAR



The more than 22,461 customers of ILLINOIS GEAR . . . *and every one a satisfied customer* . . . are the hardest working salesmen ever.

Gears they use are on the job every day . . . telling the story of outstanding quality and performance that characterizes Illinois Gears.

The great array of fine equipment and machinery of which they are a part is indicative of the wide range of types and sizes of Illinois Gears . . . America's *most complete line of gears.*

Regardless of the service, whether it's gears for rotating massive shovels, or gears that control delicate precision equipment — depend on ILLINOIS GEARS.

Look for this mark ILLG® *the symbol on finer gears*

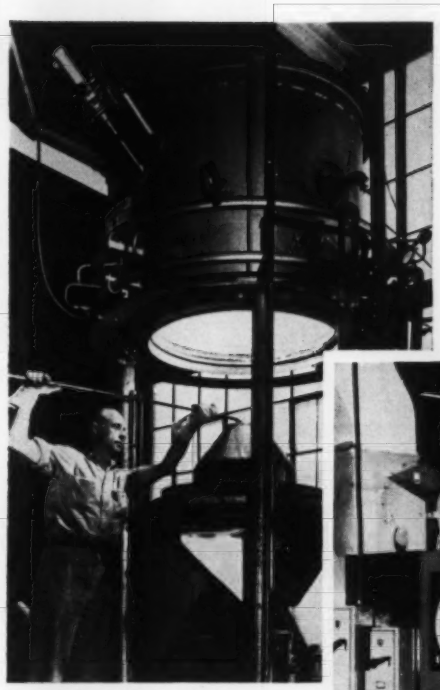
ILLINOIS GEARS® Reg. U.S. Pat. Off.

Gears for Every Purpose ... one gear or 10,000 or more

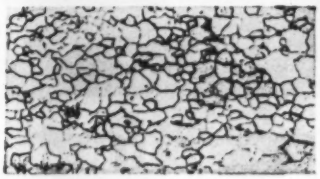
ILLINOIS GEAR & MACHINE COMPANY

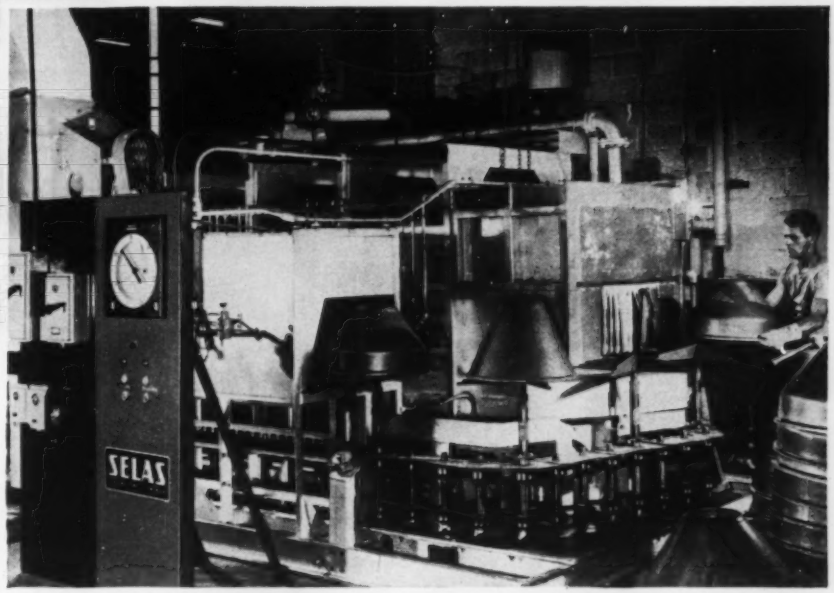
2108 NORTH NATCHEZ AVENUE • CHICAGO 35, ILLINOIS

SHORT RUNS or HIGH PRODUCTION



Conical shapes, spun and drawn from Type 430Ti stainless steel discs, require intermediate annealing to remove work-hardening effects. Annealing follows both spinning and deep-drawing operations. This elevator-type Gradiation furnace, occupying only 4 ft by 4 ft floor space, processed 20 pieces per hour.





When production capacity of 120 pieces per hour was desired, Selas designed and built this continuous furnace. The space-saving 16-foot long chamber heats cones to 1600°F; a cooling tunnel delivers work-pieces at less than 350°F for convenient handling. Both shapes are accommodated interchangeably without furnace adjustment and, as in the original elevator-type furnace, only one operator is required to load and unload. Same metallurgical structure (shown at left–500X) is obtained with both methods.

. . . SELAS builds heat processing equipment to meet your specific needs

• When production requirements were low, Selas designed and built an elevator-type furnace for a leading metal fabricator to anneal stainless steel conical shapes.

Then, as demand for his product grew beyond the capacity of the elevator-batch-type furnace, Selas designed and built a continuous, automatic tunnel furnace which increased his output six-fold.

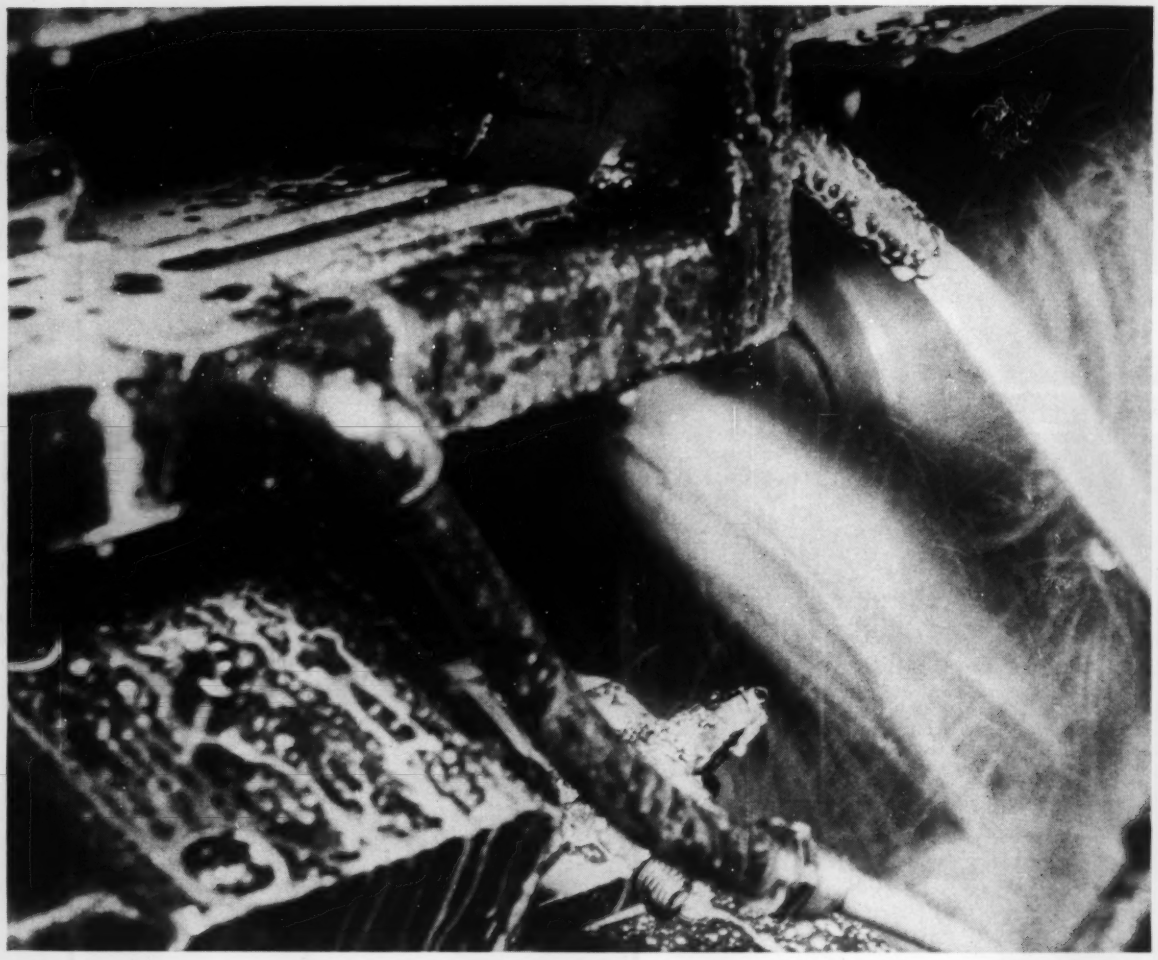
Both furnaces use fast, precise Gradiation® heating to achieve metallurgical uniformity within each part and from part to part.

Whatever your requirements—short runs or high production, batch or continuous operations—you are invited to discuss them with our engineers. Write for informative articles on Selas heat processing. Address Dept. 24.

SELAS
CORPORATION OF AMERICA
DRESHER, PENNSYLVANIA

Heat and Fluid Processing Engineers

DEVELOPMENT • DESIGN • CONSTRUCTION



And we thought we were getting

Machine shops everywhere are finding that new high production goals can be set after trying

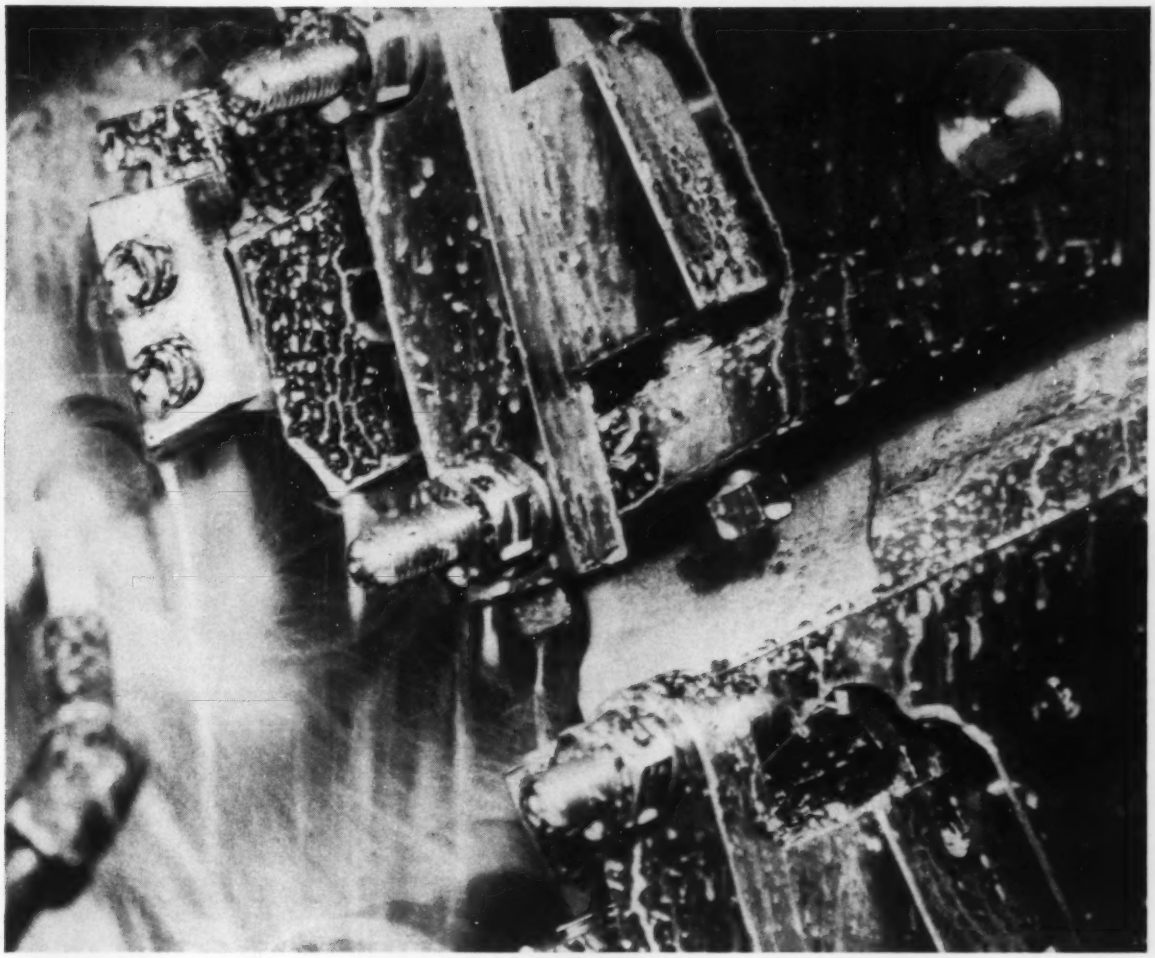
ANTISEP
Base

We laughed when the man from Houghton told us about some of the amazing results other shops were getting with ANTISEP All Purpose Cutting Base. We thought if we got even half of what he promised we would be satisfied. So we agreed to a test.

Now we believe him. ANTISEP Base actually made a bigger difference than he predicted. Both speeds and feeds were increased far beyond what we thought was the best our machines could do.

We found that mixed 1:25 with water, ANTISEP Base lets us cut more metal faster than any oil-base product used before. The super-cooling power and extra lubricity are the reasons why. And there's no smoke, no rancidity and no chip build-up.

Finish quality is limited only by the capabilities of tool and machine. The Houghton man offers ANTISEP as just one of a large family of superior cutting oils and bases. He knows their capabilities, and he can help you, too.



the maximum out of our automatics!

HOUGHTON'S FAMILY OF CUTTING OILS AND BASES:

Cut-Max	Series of fortified ready-to-use cutting oils and concentrated bases for dilution by user.
Antisep All-Purpose Base	Miscible with either water or oil; for 90% of all machining uses.
Antisep Soluble Grinding Oil	Antiseptically treated; detergent action; releases grinding dust.
Houghto-Grind 50	Grinding concentrate; stops rust, won't load wheel.
M. M. Honing Oil	Beats kerosene for honing.

ANTISEP BASE

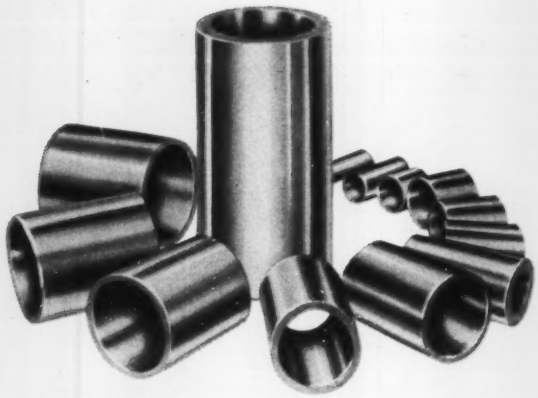
...a product of

E. F. HOUGHTON & CO.

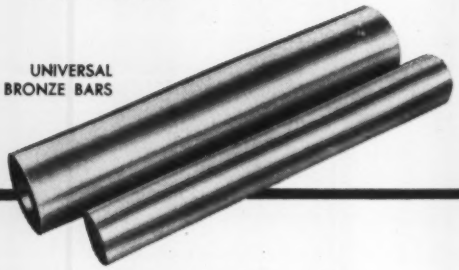
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

GRAPHITED BRONZE

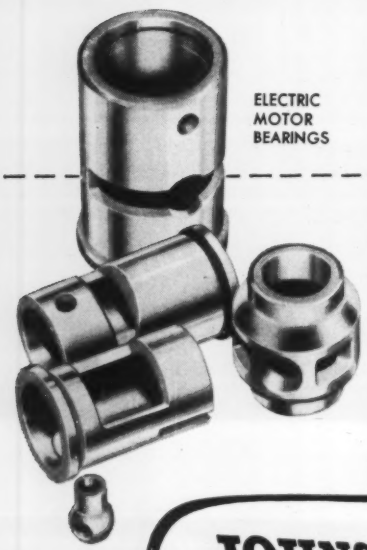


GENERAL PURPOSE



UNIVERSAL BRONZE BARS

LEDALOYL SELF-LUBRICATING



ELECTRIC MOTOR BEARINGS

Over 2300 types and sizes of bearings and bars in stock

Johnson Bronze can supply over 1900 sizes and types of sleeve bearings, and over 400 sizes of bronze bars from stock. This includes standard stock GP bearings, graphited bearings, Ledaloyl self-lubricating bearings, and electric motor bearings made to motor specifications. You can select an economical standard bearing for almost any application from this large stock. For complete details on how Johnson Bronze stock bearings can save you money, contact your Johnson distributor.

JOHNSON Bearings

Johnson Bronze

550 South Mill Street • New Castle, Pa.

For the better part of 3½ years, this giant press—largest of its kind—has operated three shifts a day, seven days a week, doing with a single hit what formerly required two forming operations on a 3000-ton press.

4000-ton Hamilton press produces formed truck and bus rails from flat blanks in a single hit

By producing completely formed side rails from flat blanks in a single operation, this press has eliminated costly and time-consuming die changes, storage of partly formed rails between operations, and attendant materials handling problems. It does not give camber, or bow, to the rails and so this huge Hamilton press has eliminated the need for intermediate and final straightening operations.

Simplicity of lubrication is an important factor in the successful operation of this press. A special system, built in during installation, results in positive, efficient oiling of all moving parts with foolproof ease.

For all its 4000-ton capacity, the press weighs only 900 tons, stands only 43 ft. high, and is only 30 ft. 10 in. wide, 12 ft. 10 in. deep. It is driven by a 150 hp motor turning up 1200 rpm. The stroke is 22 in., operating speed is seven hits per minute.

Write to Hamilton Division, B-L-H Corporation, for full information and specifications on the line of Hamilton heavy duty presses.

Low-carbon sheet steel side rail blanks up to 26½ ft. long by 3/8 in. thick are fed into the press at the Cleveland Plant of Midland Steel Products Company. The operating crew varies from four to eight men, depending on size of rails being formed.

Hamilton Division Hamilton, Ohio

BALDWIN · LIMA · HAMILTON

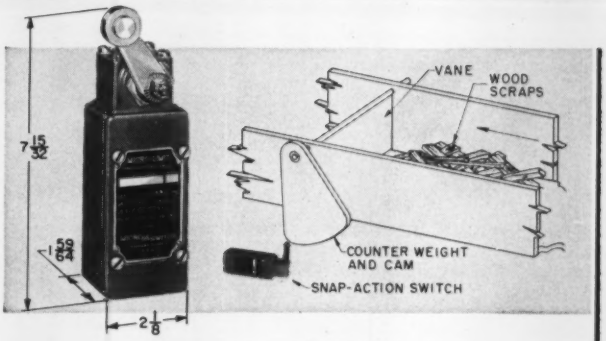
Diesel engines • Mechanical and hydraulic presses • Can making machinery • Machine tools

BALDWIN BLH LIMA-HAMILTON

MICRO SWITCH . . . FIRST IN PRECISION SWITCHING

MICRO SWITCH "ML" Switch is control limit to avoid conveyor jams

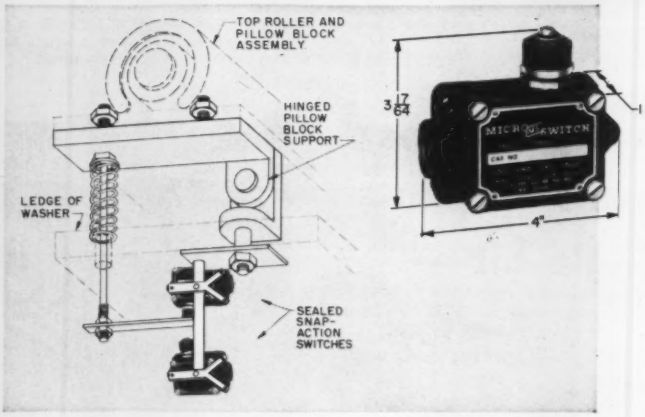
This conveyor system was designed to carry off wood scraps. A vane is constructed in the conveyor line so that material passing down the line presses against the vane in case of a jam-up. The vane is counterweighted by a sector cam made of heavy steel plate. When the lowering of the cam operates the "ML" switch, the conveyor line shuts down. The "ML" switch was selected because it is sealed against weather and permits a 60° overtravel.



MICRO SWITCH "ML" switches combine rugged construction with precise operation. Both single and two-circuit switching units are available. Electrical rating is 20 amperes 120, 240, 480 volts, ac ; ½ ampere 115 volts dc ; ¼ ampere 230 volts dc ; ¾ H.P. 110 volts ac ; 1½ H.P. 220 volts ac.

How to make your production dollar go farther—with

MICRO SWITCH PRECISION SWITCHES



Tension kept within limits by spring lever working between two switches

Fabric tension in a bleaching and dyeing machine is kept from becoming too great or too slack by the use of two MICRO SWITCH "F" switches. The switches are positioned to stop the machine in the event the material passing through the top roller becomes too tight or too loose. Slackening of the cloth brings the lever against the upper switch. Excessive tension releases the springs and the bottom switch is actuated. The Type "F" switches were selected because of their dependability and their sealed protection against moisture and dirt.

MICRO SWITCH "F" switches are long-lived precision switches with the capacity for making and breaking steady state currents of 20 amperes and switching inrush currents as high as 75 amperes.

There are thousands of applications for MICRO SWITCH switches on plant equipment. For additional information on how to use MICRO SWITCH precision switches, let us send you MICRO Tips Digest—a gold mine of profit-making suggestions.

MICRO SWITCH distributors with full stocks of switches for every plant use requirement are located near you. Look under "Switches, Electric" in the Yellow Pages.

MICRO SWITCH

A DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR COMPANY

In Canada, Leaside, Toronto 17, Ontario • FREEPORT, ILLINOIS

15-ft. planer in the Eddystone Division's Southwark Shop.

General Machine Shop at the Eddystone Division, Eddystone Pa., whose 1,500,000 square feet of manufacturing space includes huge fabrication shops and a nonferrous castings foundry.

•

Blooming an ingot at the Standard Steel Works Division, Burnham Pa., under one of the 2500-ton hydraulic presses.

Vast, integrated Baldwin-Lima-Hamilton facilities enable Loewy-Hydropress to deliver your rolling mills on time

When Loewy-Hydropress designs and builds your rolling mills, you aren't plagued by the usual troublesome and expensive delivery delay. For Loewy has at its disposal the vast, yet smoothly integrated resources of the entire Baldwin-Lima-Hamilton Corporation.

The two B-L-H divisions called upon most frequently to make parts for Loewy-designed rolling mills are the Standard Steel Works and Eddystone Divisions. The necessary steel components are cast or forged at Standard. And Eddystone, with its extensive machining facilities, supplies the completely finished nonferrous castings and weldments. Other members of the B-L-H family with excellent facilities for producing rolling mill parts are the Hamilton Division, Hamilton, Ohio; the Austin-Western Division, Aurora, Ill.; and the Madsen Division, La Mirada, Calif.

Close coordination among all Baldwin-Lima-Hamilton divisions is the chief reason why Loewy-Hydropress can deliver your rolling mills faster.

To your individual production requirements, we design, build and install hot and cold rolling mills for ferrous and nonferrous metals, continuous merchant and wire-rod mills, skelp mills, two-high and three-high blooming mills, high-speed foil mills, continuous billet and sheet-bar mills, strip, slabbing, plate, structural, rail mills, and special mills. Write us today, Dept. B-4, for illustrated bulletin L-164.

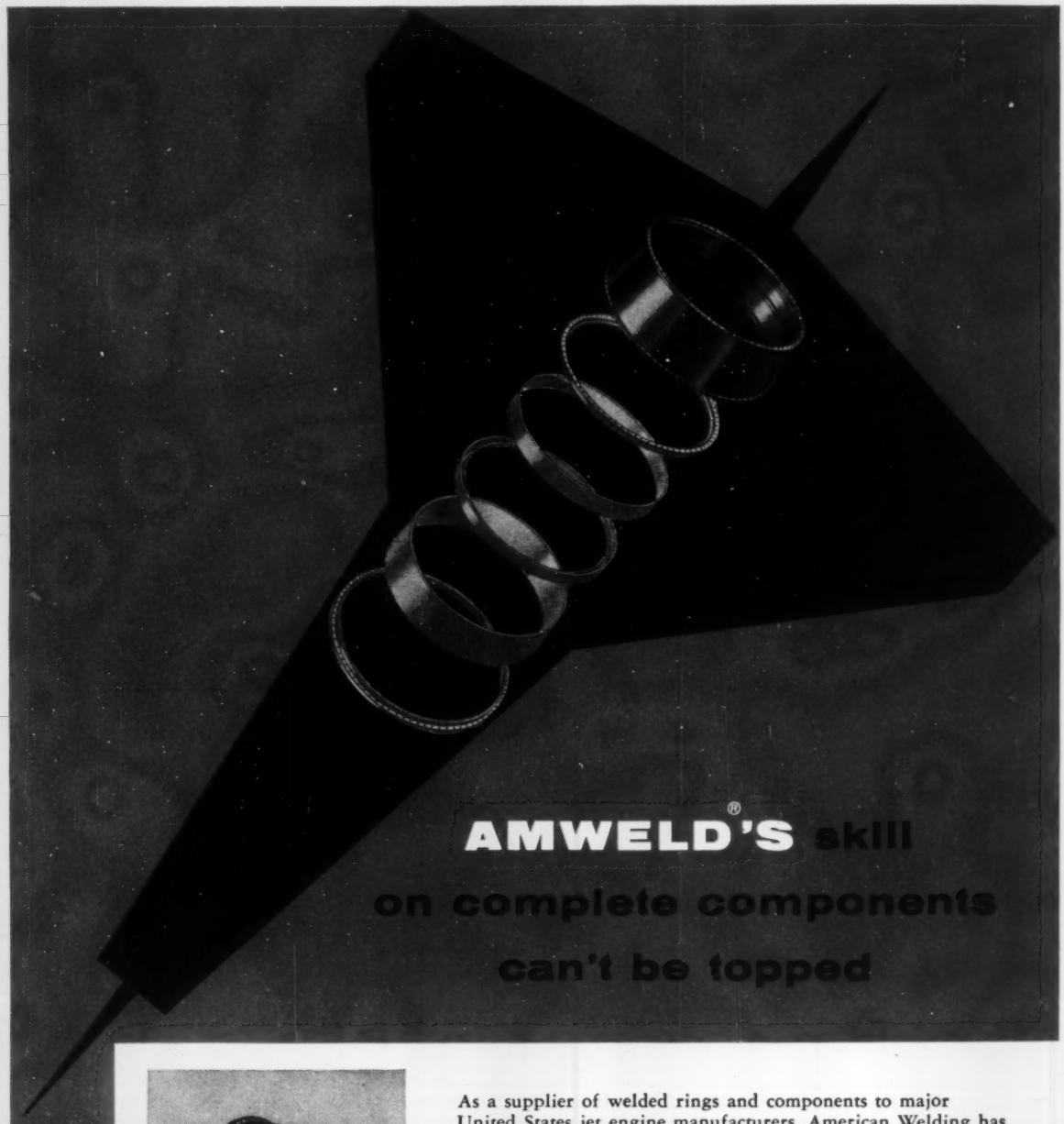
Loewy-Hydropress designers at the company's headquarters in New York City.

Loewy-Hydropress Division

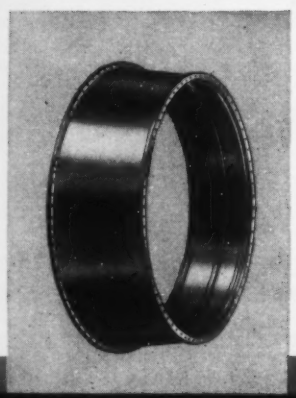
BALDWIN · LIMA · HAMILTON

111 FIFTH AVENUE, NEW YORK 3, N.Y. Rolling mills • Hydraulic machinery • Industrial engineering

BALDWIN BLH LIMA-HAMILTON



AMWELD® skill
on complete components
can't be topped



As a supplier of welded rings and components to major United States jet engine manufacturers, American Welding has proven its skill as part of an industry where cost and precision are vital factors. As the missile and rocket programs grow from the experimental to the production stage, Amweld's experience and skill can play a part in these essential programs.

If you have a problem that can be solved by a rolled and welded ring or component, or any welded fabrication, contact American Welding's Industrial Products Division. Their skill, experience, and engineering are at your service.

THE AMERICAN WELDING & MANUFACTURING COMPANY
110 DIETZ ROAD WARREN, OHIO

AMERICAN WELDING
The World's Leading Manufacturer of Welded Rings

Metalworking Outlook

Slip in Appliances

Appliance makers still profess "restrained optimism" about 1957's business prospects, despite numerous cutbacks in production. Samples: Admiral Corp. has "indefinitely" closed its Bloomington, Ill., plant where it had planned to produce radio and television components. Westinghouse Electric Corp. has gone on a four-day week at Columbus, O., where it makes refrigerators, freezers, dishwashers and combination washer-dryers. General Electric Co. has indefinitely furloughed 300 in its home laundry department at Louisville. American Motors Corp.'s Kelvinator Division closed down its refrigerator lines in Detroit and Grand Rapids, Mich., five days last week and furloughed 350 at Grand Rapids.

Dip in Consumer Credit

Consumer credit outstanding dropped to $40.5 billion at the end of February, the Federal Reserve Board reports. That's $403 million below January and $3 billion better than year-ago figures. Installment credit was off $65 million in February, compared with February increase of $29 million in 1956. Automobile paper gained $21 million, compared with a $93 million jump in February, 1956.

The Short Week

The United Auto Workers starts beating the drum for the short week today (Apr. 8) as its convention opens in Atlantic City, N. J. Delegates are expected to vote overwhelmingly in favor of the issue as a major bargaining matter in 1958. The International Association of Machinists stole a little of the UAW's thunder by revealing on Mar. 26 that it will drive for the 30-hour week, too.

The Beck Affair

Labor leaders are thoroughly alarmed over possible legislative effects of the Dave Beck affair. Outlook: More states will pass right-to-work laws (18 have them, and bills are pending before Delaware and Idaho legislatures), but U.S. legislators will move slowly and probably won't enact much significant legislation this year. One sidelight: Some union leaders are hastening to make public their salaries, although they are silent about expense accounts. The AFL-CIO president gets $35,000; the UAW chief, $18,000; the steelworkers' head, $50,000; the IUE prexy, $18,000.

Aid for Small Business?

Small business should be helped by a Supreme Court ruling. It approves the use of lockouts by members of an employer association if a union calls a strike against a single member. The decision strengthens industry in

combating "shipsawing," a term applied when a union calls a strike against one member of an association at a time, rather than taking on the whole group at once.

Three Problems for Engineers

For the remainder of this century engineers must wrestle with these three most important problems, believes J. A. Hutcheson, Westinghouse vice president for engineering and research: 1. The shortage of basic materials. 2. The steadily increasing need for more electric power. 3. The demand for improved productivity.

Coming: H-Iron Pilot Plant

Research into direct reduction of iron ore to iron is far enough along that Adm. Ben Moreell, chairman of Jones & Laughlin Steel Corp., sees a possibility that in a year and a half a commercial plant can be built for the process (H-iron). J&L is associated with Hydrocarbon Research Inc. in research on the matter at Trenton, N. J. The H-iron process was developed by Hydrocarbon and Bethlehem Steel Co., which continue their joint work.

Growth in Aluminum

U.S. aluminum consumption has increased an average of 11.6 per cent per year since 1900. A survey by the Business & Defense Services Administration shows that the U.S. turns out 46 per cent of the world's aluminum; Canada produces 18 per cent. From 1900 to 1954, world production of the metal climbed 11 per cent annually.

Recommendations for Railroads

American railroads should buy 100,000 new freight cars a year for the next five years and boost their capital spending by 50 per cent to $1.5 billion a year. That's the advice of Robert Heller & Associates, Cleveland management consultant retained by Association of American Railroads. Annual capital spending should be $800 million for cars, $200 million for diesels, $100 million for passenger equipment and more than $375 million for roadway improvements, etc.

Straws in the Wind

Bankers and construction executives expect home building to remain slow. Most optimistic predictions: 1 million starts in 1957 . . . Capacity is ample to fabricate the great tonnages of structural steel needed for the road program, predicts L. Abbett Post, executive vice president of the American Institute of Steel Construction . . . Absenteeism is costing American workers 13 per cent of their potential annual income and industry more than $1.8 billion in lost production yearly, says the Research Council for Economic Security . . . The Post Office will issue a 3-cent stamp on May 22 at the time of the American Iron & Steel Institute meeting to commemorate steel with the wording, "America & Steel Growing Together."

What's the lowest cost way to produce steel parts like these?

You may be paying considerably more than you need to for parts like these if you aren't taking advantage of Ryerson flame-cutting service.

Size makes no difference—nor intricacy of shape. You can order one part or one thousand and get quick delivery of steel cut to close tolerance—with almost die-cut accuracy from piece to piece. And here's where the saving comes in:

1. **No dies or molds** are needed so you save this cost when you switch from cast or forged parts to flame-cut parts.
2. **Less machining** is usually required to finish a flame-cut part. Sometimes machining is eliminated altogether.
3. **Freight costs lower**—If you're now paying freight on steel you later scrap you may well be able to pay for flame cutting with the money you save by shipping lighter flame-cut parts. The blank for a 6″ disc is 49% heavier than the disc itself. Storage and handling expenses are reduced, too.
4. **Less time in process**—You can often convert finished products into cash more quickly because parts can be produced faster by flame cutting.
5. **No loss on spoilage or rejects**—They're our problem—not yours.
6. **Design changes are simpler** and can be made more frequently without sacrificing manufacturing economy.

You draw on the nation's largest steel stocks at Ryerson—and unequalled flame-cutting facilities are ready to work for you. A blue print or sketch with clearly marked dimensions is all we need for prompt handling of your requirements. Call your nearby Ryerson plant for cost-cutting flame-cut steel today.

In stock: Carbon, alloy and stainless steel—bars, structurals, plates, sheets and strip, tubing, re-bars—industrial plastics, machinery & tools, etc.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE • CINCINNATI CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

The PROOF of a COMPANY

(for example, DSC)

is in the way it GROWS and in the CUSTOMERS IT KEEPS

IN THE BEGINNING — DSC started in 1923 as a "dot" on the map of Detroit and not much more in the steel industry . . . with a single plant, a single product (Cold Rolled Steel Strip), a capacity of 1,000 tons a month and about 150 employees.

TODAY — Now there are three DSC plants, about 5,000 employees and the range of products is shown below.

PORTSMOUTH DIVISION, NEW BOSTON, O.

Producers of

Coke . . . Coal Chemicals . . . Pig Iron
BASIC OPEN HEARTH STEEL
Ingots . . . Blooms . . . Slabs
Billets . . . Wire Rods
Hot Rolled and Cold Rolled Sheets
Manufacturers' and Specialty Wire
Aluminum Cable Strand Reinforcement
Rope Wire . . . Tire Bead Wire
Welded Wire Fabric for Concrete Reinforcement

MILL DIVISION

DETROIT, MICH. HAMDEN, CONN.

Producers of

Cold Rolled Steel Strip
Flat Cold Rolled Spring Steel

HOW DSC GREW — The annual capacity of our Detroit and Eastern plants combined is 225,000 tons of Cold Rolled Steel Strip and Flat Cold Rolled Spring Steel.

Our Portsmouth Division has annual capacities of 550,000 tons of coke, 768,000 tons of pig iron, 1,500,000 tons of basic open hearth steel with facilities for proportionate capacities of Hot Rolled and Cold Rolled Sheets, and Rod and Wire commodities.

WHAT IT MEANS — If this growth can be attributed to any one reason—it is that over the years, under changing business conditions, DSC products, policies and practices have performed profitably for an increasing number of customers . . . and we're still growing.

Would you like a DSC Customer "Rep" to see you about your profitable use of DSC products and services?

Call him . . . today?

Customer Satisfaction Is Our Business

DETROIT STEEL CORPORATION

GENERAL SALES OFFICE - DETROIT 9, MICH.

DSC CUSTOMER "REP" OFFICES—Charlotte, N.C., Chicago, Cincinnati, Cleveland, Columbus, O., Dayton, O., Detroit, Grand Rapids, Mich., Hamden (New Haven), Conn., Indianapolis, Jackson, Mich., Louisville, Ky., Milwaukee, Wis., New York, St. Louis, Toledo, O., Worcester, Mass.

COPYRIGHT 1957

Built-In Inflation!

A few days ago the executive vice president of a major corporation told us he had just learned that a leading competitor would raise wages 14 cents an hour on Apr. 1.

"The only thing we can do," he said, "is to raise ours an equal amount, although the base rate in our industry already is up to $2.86 an hour. We know we are contributing to inflation, but we must keep up with the parade."

His company (all companies, in fact) is obliged to yield to an inflationary force built so solidly into our economy that it is virtually unaffected by competition or ups and downs in business.

It stems from automatic annual wage increases and benefits provided by long term labor contracts. It is a force that is felt by every company whether it has escalator wage contracts or not.

This year, 550 wage agreements will bring $700 million in automatic wage increases to 5 million workers. Cost-of-living increases will go to an estimated 3.5 million workers as the result of the rise in the consumer price index to a record level (118.7 in February).

Not to be overlooked is the high total cost of little fringes—benefits that have grown like Topsy. They now average more than 40 cents an hour.

Steel is an example of what is happening:

Base wage rates go up 7 cents an hour on July 1, plus a 0.2 cent increase in the increments between 32 job classifications. One cent is added to straight-time wages for about each half-point rise (above 116.5) in the consumer price index.

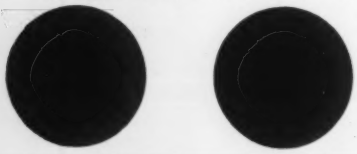
Sunday work premiums go from 10 to 20 per cent. Double time and one-tenth will be paid for work on holidays. Fringe benefits will be expanded.

The result will be a hike of $5 to $6 a ton in steel prices in July. Inevitably, it will be passed along in higher prices on components, industrial equipment and consumer products.

It will be part of another round of wage-price inflation spurred on by wages that are rising faster than productivity. It's built-in inflation that management and labor need to sit down and study realistically. The balloon is bound to have a bursting point.

Irwin H. Such
EDITOR-IN-CHIEF

Put these Lenses In...



It's A Welders Goggle #486

Put these Lenses In...

It's A Chippers Goggle #489

...either way it's AO's Safety Engineered

FLEXIBLE MASK GOGGLE

Here's eye protection equipment that can "work overtime." With welding lenses it's a welders' goggle. In a jiffy you can remove these lenses and screw on similar shape clear Super Armorplate lenses for chipping and grinding, using our "482" frame which is directly ventilated. What's more, both safety prescription glasses and regular prescription glasses can be worn comfortably under the "486" and "489" goggle.

QUICK FACTS

Very comfortable soft vinylite mask. Fits closely — leaves no open gaps.

Indirect ventilation louvers prevent lens fogging.

Flame-resistant, plastic lens adapter. Accommodates our standard lens ring and regular 50 mm. round filter lenses and cover lenses.

#486 Goggle is fitted with Noviweld filter lenses, shades 3, 4, 5, 6.

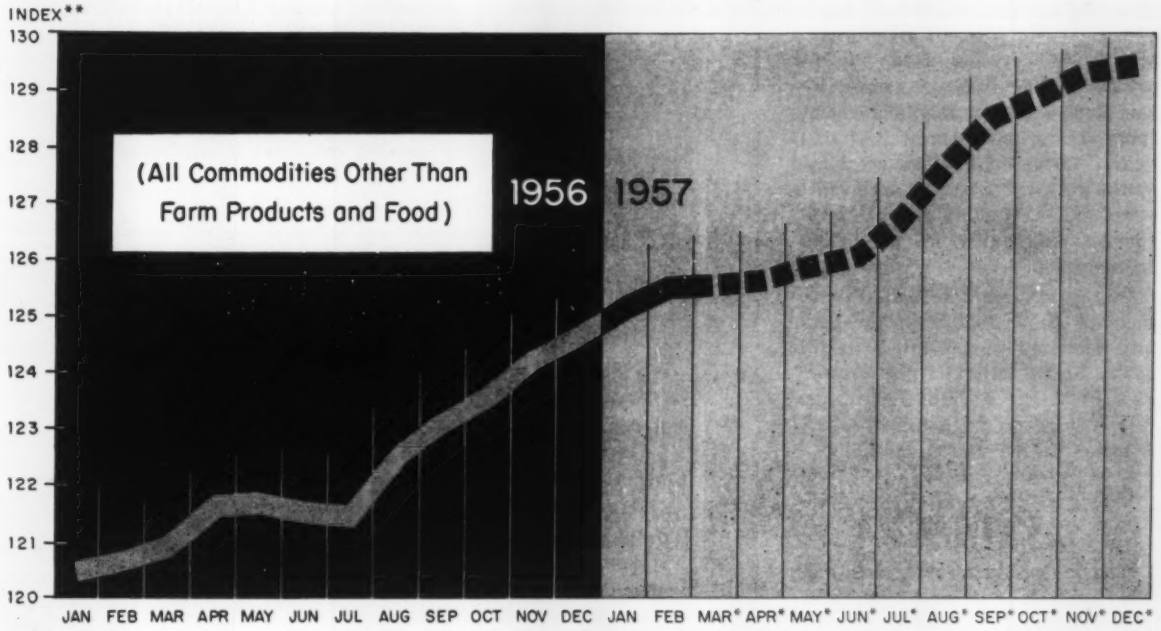
#489 Goggle is fitted with clear SAP lenses.

Always insist on the AO Trademark on lenses and frames.

American Optical
COMPANY
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS
Branches in Principal Cities

Wholesale Price Index To Rise 3.9 Points by Year End



*Estimated.

**1947-1949=100.

Price Hikes Shape Up

Steel and labor increases guarantee metalworking price upsurge in second half. Boosts will be common but less severe and more sporadic than they were in 1956

THE TRICKLE of price hikes by component and equipment firms since the first of the year will turn into a steady drizzle after July 1. Major reasons: Anticipated $5 to $6 a ton rise in the base price of steel around midyear and scheduled wage increases (see STEEL, Mar. 25, p. 147).

Dependent — Component and equipment manufacturers are pretty much dependent upon what steel does. When steel goes up, so will their prices.

Since January, the cost of steel extras has been mounting. Most manufacturers are waiting for the base price rise to pass on their materials increase to customers in one big chunk: Many will pass on all hikes; others will absorb some; a few will absorb all.

Even if steel costs stood still, other prices probably would be revised upward slightly. Reason: Wage increases for labor in most equipment and component manufacturing firms.

Up and Up — Labor expenses (which along with soaring costs of coal, coke and pig iron, are causing the steel hike) affect most firms' pricing outlook for the rest of the year. Many metalworking companies are tied to long term contracts which have annual raise clauses. Another wage factor is the escalator clause: As prices and cost of living go up, management has to fatten labor's pay check.

The Labor department estimates about 5 million workers will get automatic wage hikes this year from some 550 contracts that grant deferred boosts. Metalworkers' average: About 7.5 to 8 cents an hour.

Other costs of doing business are shooting up, too: Materials, machinery, financing, construction. Industry has little opportunity to absorb costs.

Silver Lining—Price climbs this year will not be so widespread or heavy as they were in 1956. In fact, there's a minor trend toward stabilization. Many industries will absorb increases.

Competition may put the brakes on some price hikes, but not enough to offset a general rise in metalworking quotations.

Bird Dogging — Pressures from

Washington are having little effect. As one fastener manufacturer puts it: "One morning we received a request from Washington to keep our prices down. That afternoon we were notified of a 6.5 per cent increase in steel extras. Our prices are going up."

Not all increases occasioned by the steel boost in July and rising labor costs will materialize this year. Firms with large steel inventories won't feel the pinch until year end. Probable result: Look for delayed equipment price rises in early 1958.

Increases in equipment and components are indicative of the general economy—a gentle rise in all costs. STEEL estimates the Wholesale Price Index (see chart, page 59) will go up 3.9 points to 129.4 between March and year end.

Components

Component makers, who will be the first to feel the steel hike, think prices will climb in most categories. (See box, right, for survey of the industry's purchasing agents.) Here's how the component picture shapes up for the rest of 1957:

Fasteners—Most companies have recently increased steel part prices 4 to 5 per cent. Some decreases are noted in fasteners using large amounts of copper—prices of that metal are falling. Outlook: If steel goes up, steel fastener prices will rise proportionately.

Says Harry McCully, vice president-sales, Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.: "We shall be faced with another cost problem around midyear when the steel industry gives a new wage rise under the terms of its labor contracts. When this happens, we'll have to revise our market pattern again."

Stampings — Competition is the big factor here. Most firms have to hustle hard for business. Manufacturers are reluctant to boost prices but generally agree the proposed steel hike plus automatic wage increases in their own industry will probably mean a 5 per cent price jump later in the year.

Stampers have so far absorbed the cost of extras, but production efficiency has just about reached the point of saturation. As one company puts it: "Automation doesn't work too well in contract manufacturing."

Gears—Most makers raised prices late in 1956. They look for an increase of around 5 per cent this year. Reasons: Mounting cost of their own labor; steel increases.

Special orders and relatively short runs make absorption of costs through increased production difficult. Competition tends to hold prices down less than it does in other industries.

Gray Iron Castings—Look for a 4 to 6 per cent price rise scattered through the second half as shops get hit with wage hikes. A concerted effort to absorb costs will not be entirely successful because of upward moving labor and raw material costs.

Electric Motors—Competition is fierce here. Most manufacturers are worried about pricing themselves out of the market. Look for prices to stabilize this year, with companies absorbing increased costs. Problem: How to take on added expense and still put out a high quality product without sacrificing profit.

Forgings — Prediction is that steel forgings will go up 5 to 8 per cent this year, with the major rise coming in the late fall. Alloy forging prices will tend to stabilize. Companies plan to absorb their own labor increases but will have to pass on rises in steel. Increasingly competitive market and more efficient production will temper changes.

Screw Machine Products — Most companies have absorbed as many costs as they can handle. Probability: A 5 to 7 per cent price increase after midyear to compensate for more expensive steel and labor in their own plants.

Will Component Prices Rise?

(Estimates of 200 purchasing agents surveyed)

Castings, die—72 per cent think prices will stabilize; 28 per cent see an average rise of 5 per cent.

Castings, gray iron—44 per cent think prices will stabilize; 50 per cent see an average rise of 6 per cent; 6 per cent see an average fall of 5 per cent.

Castings, malleable—42 per cent think prices will stabilize; 54 per cent see an average rise of 5 per cent; 4 per cent see an average fall of 2 per cent.

Castings, nonferrous—52 per cent think prices will stabilize; 21 per cent see an average rise of 7 per cent; 27 per cent see an average fall of 4 per cent.

Castings, steel—29 per cent think prices will stabilize; 64 per cent see an average rise of 5 per cent; 7 per cent see an average fall of 6 per cent.

Forgings—27 per cent think prices will stabilize; 73 per cent see an average rise of 6 per cent.

Stampings—29 per cent think prices will stabilize; 71 per cent see an average rise of 5 per cent.

Springs, wire shapes—38 per cent think prices will stabilize; 62 per cent see an average rise of 6 per cent.

Bearings, antifriction—54 per cent think prices will stabilize; 46 per cent see an average rise of 6 per cent.

Couplings, hose—70 per cent think prices will stabilize; 30 per cent see an average rise of 6 per cent.

Cylinders, air, hydraulic—52 per cent think prices will stabilize; 48 per cent see an average rise of 7 per cent.

Gears—33 per cent think prices will stabilize; 63 per cent see an average rise of 5 per cent; 4 per cent see an average fall of 6 per cent.

Screw machine products—27 per cent think prices will stabilize; 63 per cent see an average rise of 6 per cent; 10 per cent see an average fall of 4 per cent.

Fasteners—37 per cent think prices will stabilize; 55 per cent see an average rise of 6 per cent; 8 per cent see an average fall of 5 per cent.

Electrical equipment (solenoids) relays, switches, resistors—54 per cent think prices will stabilize; 39 per cent see an average rise of 5 per cent; 7 per cent see an average fall of 5 per cent.

Electric motors (fractional)—70 per cent think prices will stabilize; 26 per cent see an average rise of 5 per cent; 4 per cent see an average fall of 7 per cent.

Electric motors (1-5 hp)—57 per cent think prices will stabilize; 33 per cent see an average rise of 6 per cent; 10 per cent see an average fall of 5 per cent.

Electric motors (over 5 hp)—60 per cent think prices will stabilize; 35 per cent see an average rise of 5 per cent; 5 per cent see an average fall of 7 per cent.

Rubber goods, mechanical—48 per cent think prices will stabilize; 41 per cent see an average rise of 5 per cent; 11 per cent see an average fall of 5 per cent.

Belting, belt drives—58 per cent think prices will stabilize; 38 per cent see an average rise of 5 per cent; 4 per cent see an average fall of 10 per cent.

Equipment

Metalworking equipment prices will fluctuate less than those of components during the remainder of 1957. Mainly responsible: Large inventories of steel and the ability to absorb costs better. Outlook is for greater stabilization than last year, but the net change will be slightly upward. Here's the rundown on the 1957 equipment picture:

Material Handling — Manufacturers think prices will remain fairly stable. Price adjustments last fall are just beginning to be felt in increased revenues. Most firms won't be hurt by the steel hike this year because of large inventories. Others will be protected by sales escalator clauses that compensate for rises in material.

As inventories decline at year end, the industry will consider another hike. Outlook: A 5 to 10 per cent across the board increase in early 1958. Scheduled increases to labor in the summer months could accelerate the timing.

Competition isn't expected to hold prices down much because business is generally good. But if business should tighten up, look for the industry to absorb more costs.

Machine Tools — Industrywise, the trend is toward stabilization. When steel goes up, some firms will raise prices 3 to 10 per cent, but this will be sporadic. A few companies are using escalator clauses in quotations to compensate for higher material costs.

Severe competition is holding back price increases in the machine tool industry. Other factors: Three-year labor contracts and a market that is leveling off. Most machine tool companies are caught in a cost-price squeeze. Profit margins are shrinking.

One factor that may add to higher prices on special machine tools is explained by Marvin Anderson, president, Michigan Tool Co., Detroit: "Service on machines has increased. This also means more instruction for users and repairmen. The cost of such instruction may be reflected by slightly higher prices in some areas."

Welding Equipment—Watch for costs to stabilize in 1957. The industry in general raised prices about 10 per cent last year—sees no need for adjustments in 1957.

Manufacturers hope to absorb labor and material boosts by more efficient production and operation. Competition will exert downward pressures.

Conveyors — Steel hikes plus rising labor costs will jack up prices this year. If business falls off, competition could have a restraining influence—otherwise, it's not too important a factor.

The industry is making an effort to absorb more costs. Major difficulty: Many products are tailormade, making long runs and more economical production impossible.

Industrial Heating—Labor, steel and alloy increases this year should bring an average increase of around 5 per cent. Manufacturers of industrial heating furnaces say they're pretty much "hooked" to the steel pattern, and prices won't stabilize until steel does.

Cost absorption won't play an important part in the price picture. Since 1954, materials have gone up 35 per cent, and many industry people believe they have reached maximum efficiency.

Buyers' resistance may hold the key to the price pattern. As one Cleveland manufacturer put it: "Most customers recognize that our costs have increased, but they still refuse to pay more."

Recap—Prices will rise in 1957 but not so generally or dramatically as they did last year. Though there is some leveling off by individual manufacturers, don't look for prices to stabilize in the foreseeable future.

---

* *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

Youngstown Sheet & Tube Co.

Wanted: Bargain Expansion

J&L's Moreell cites need for technological breakthrough to cut cost of building new steel capacity; Acme Steel shows one way. It combines cupolas and the oxygen converter

THE STEEL industry is closely watching Acme Steel Co.'s new oxygen converter steel plant at Riverdale, Ill., which the Chicago firm says is being built at a cost of only $51 per annual ingot ton.

Acme Steel is starting a program to construct a steelmaking and rolling mill plant which will include two hot blast cupolas (to produce molten iron from pig iron, scrap, limestone and coke) and oxygen converter facilities (to produce steel).

New Twist—The combination of cupolas with converters is new. But the separate components have been used before. Acme says: "The cupola is the cheapest and most efficient method known for melting cold metallics and has been predominant in the iron casting industry for a century or more. Today, cupolas have been greatly improved by the use of preheated blast and many other improvements in construction."

Plans call for completion of the steelmaking plant by early 1959. Its annual capacity of 450,000 ingot tons will provide 70 per cent of requirements for the rolling mill. "Construction cost of these facilities is estimated at $51 per annual ingot ton," the report states.

Higher Cost—Charles M. White, chairman of Republic Steel Corp., Cleveland, announced his firm's current expansion is costing $86 per annual ingot ton. Said Mr. White: "The company was able to hold down the cost by expanding at existing plant locations."

To build a conventional new steel plant today, Mr. White continued, would require a capital outlay of $350 per ton of annual capacity.

Keynote — Adm. Ben Moreell, chairman of Jones & Laughlin Steel Corp., Pittsburgh, recently sounded the need of the entire steel industry for a "technological breakthrough" to reduce the cost of steel production.

"When all the spots have been expanded in existing facilities," he said, "more steel can be produced only by some new process that will substantially reduce the cost."

And so the eyes of steel are on Acme.

GSA Buys Mercury Through '58

The Office of Defense Mobilization has authorized the General Services Administration to extend the mercury purchase guarantee program through 1958.

Fifty thousand flasks may be purchased during that year at a guaranteed price of $225 a flask. Thirty thousand may be acquired from domestic (including Alaskan) production and 20,000 from Mexico.

Under the current program, authorized in July, 1954, the government guaranteed to purchase up to 200,000 flasks at $225 each through Dec. 31, 1957. With a guaranteed price for an incentive, domestic and Mexican sources have increased production by 50 per cent since 1953.

Pilot Plant Aids Research

Vanadium Corp. of America opened a new pilot plant at Cambridge, O. Equipped for practical research on ores and other raw materials, it will facilitate process and product development.

More Canadian Ore

Agreement between Pickands Mather and Canadian Javelin will boost supplies this year

THREE IRON MINES will be brought into production soon through the joint efforts of Canadian Javelin Ltd., Montreal, Que., and Pickands Mather & Co., Cleveland.

Joseph Smallwood, premier of Newfoundland, predicts Canadian Javelin will ship between 2 million and 3 million tons of ore from Newfoundland-Labrador by rail to Seven Islands this year.

Agreements—Part of Canadian Javelin's iron ore deposits at Wabush lake and all those at Julian lake will be developed under the agreement with Pickands Mather.

The western section of the Wabush lake deposits was covered in an agreement made in October among Pickands Mather, Canadian Javelin and the Steel Co. of Canada Ltd., Hamilton, Ont.

The two adjoining Wabush lake developments will be served by the Wabush Lake Railway, now under construction. A spur line will be built to serve the mine at Julian lake.

No Change—Premier Smallwood says the recent agreements will not disturb existing contracts, including those with British and German steel companies.

More Ore—Other new mines will increase Canada's production and exports of iron in the next five years. The Steel Co. of Canada's Hilton mines in Quebec will produce 600,000 tons of ore yearly.

Production of Caland Ore Co., a subsidiary of Inland Steel Co., Chicago, will supply 3 million tons of ore from properties adjoining Steep Rock.

In Quebec, U.S. Steel Corp.'s Cartier Mining Co. has a $150-million project similar to the nearby Iron Ore Co. of Canada's undertaking. The Canadian firm will ship about 13 million tons of ore this year.

Taconite Project Needs 2000

Needing 2000 permanent employees to operate its new taconite plant near Hoyt Lakes, Minn., Erie Mining Co. has launched one of the largest drives for skilled men in that state's history.

Jobs of all types must be booked immediately, since Erie's schedule calls for producing the first taconite pellets late this year. When the plant is in full operation, it will handle 66,000 tons of crude taconite a day, turning out 7.5 million tons of finished pellets annually.

The $300-million project has been under construction for more than three years. Managed by Pickands Mather & Co., it includes the mining and processing plant, the new town of Hoyt Lakes, a 73-mile railroad and a new harbor on Lake Superior.

New Stock Plan for U.S. Steel

At its annual meeting in Hoboken, N. J., on May 6, U.S. Steel Corp. will ask stockholders to approve a new savings fund plan which would permit eligible salaried employees to acquire common stock in the corporation.

Under the plan, an employee may save a maximum of 5 to 8 per cent of his base salary, depending upon length of service. He may elect to have all his savings invested in government securities or to have one-half invested in common stock of the corporation. For each dollar saved by the employee, U.S. Steel will contribute 50 cents. All company contributions are to be invested in U.S. Steel common. About 40,00 employees are eligible.

Ford Instrument To Build

A 150,000 sq-ft plant near Bristol, Tenn., will be built by Ford Instrument Co., a division of Sperry Rand Corp., Long Island City, N. Y.

About 1200 employees will produce equipment for naval ordnance, air navigation and missile systems.

Four Wheel Drive Expands

The remaining $925,000 in the $2.5-million expansion program of Four Wheel Drive Auto Co., Clintonville, Wis., will be spent on modernization and additional automatic machine tools. A total of $750,000 has been invested in machine tools for the Clintonville plant.

Unloader Empties 20,000-Ton Ship in 7 Hours

Installed recently at the Pennsylvania Railroad's Greenwich Point pier, Philadelphia, this Dravo man trolley unloader can handle the largest carriers afloat. Weighing almost 1300 tons, it is powered by 20 electric motors with a total rating of 2137 hp. The bucket has a capacity of 22½-tons, can reach 73 ft from the dock face and can be lowered nearly 30 ft below the normal water level

1. *If you were selecting one of several employees of equal seniority for transfer to a job requiring setups by the operators, what experience or skill factors would you consider most carefully?*

2. *A new job has been set up and is ready to run. What should the supervisor do before turning the job over to the operator?*

3. *To avoid buck passing, who should see that a periodical "quality of workmanship" check is being made?*

4. *A worker has been warned for repeatedly indulging in horseplay. The supervisor caught him in an apparent horseplay situation, reprimanded him and then fired him because the worker became surly. Did the supervisor do the right thing?*

How To Train Foremen

CAN YOU answer 71 questions like the above correctly?

Some 60 foremen from Cleveland companies are working on the assignment in 2-hour weekly sessions which run for 14 weeks.

Why — They're taking part in production seminars sponsored by the Associated Industries of Cleveland and operated by the Cleveland Board of Education. The program's purpose: To help people make better personal adjustments to the increasing responsibilities of the supervisor's job.

Comments the Board of Education's John W. Ryan, who heads up the seminars: "Industry needs more and better trained men on the foreman level. We provide the training. Associated Industries recruits the participants."

Popular — Two years ago when the training first started, a class of 20 supervisors was rounded up. In the current round, 60 are studying in two groups. Four sessions are scheduled for next fall. "And we'll probably be oversubscribed," predicts AIC.

Tuition is only $3.50 per participant—it covers the cost of a notebook and some mimeographed material. "It's the best buy on the market today," comments one company president, who tried to enter seven of his foremen in this series but had to settle for two. "We could use the same setup in our eastern plant, but there's nothing like it offered in the community."

Agenda—In the 14 weeks, supervisors participate in discussion sessions on such matters as inducting a new man, training him, matching the man to the job, what a foreman's responsibilities should be, what he should do each day before starting his shift, how to use idle manpower, how to plan production, how to control quality, how to handle preventive maintenance, and what to do about complaints and reprimands, how to deal with superiors and with men on the line. Some of the 71 questions deal with each problem. Answers of participants are starting points for discussions.

"We get into such matters as why competition spurs the economy," says Mr. Ryan. "We try to orient the thinking of these people along sound business lines. That's important because many haven't been foremen long. They may not have thought about these matters."

Timing—Most participants come in on company time, but a few, such as foremen of third shifts, must take the course on their own. "I wasn't happy about that at first," recalls one on an 11 to 7 shift. "I was used to being in bed by the time this course was only half over, but I'm glad I came now. I've got more confidence, less tension on the job."

A major aim is to help supervisors deal with people more easily and successfully. Another is to give pointers to foremen on teaching—not only new employees but other foremen who can't come to the regular classes.

Does the program really work? Listen to one vice president of manufacturing who signed up to take the course: "The foreman I sent last year was so enthusiastic that I'm taking it now. It's going to help me to pick my supervisors."

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*

ANSWERS

1. **Ability to read blueprints.**
2. **See that the product conforms to specifications.**
3. **The supervisor.**
4. **No. The supervisor should have obtained more facts.**

Catastrophic programs extend coverage . . .

More Insurance Ahead

A DRAMATIC extension of insurance benefits is planned by the Blue Cross organization in Cleveland this summer. Hundreds of metalworking companies are in areas where similar plans have been introduced recently. Hundreds more will see the introduction of extended coverage plans this year.

The impetus for the latest boost in benefits may well have come from David McDonald, president of the United Steelworkers of America. In the 1956 steel strike, his union won benefits greater than standard Blue Cross contracts provided. (In 1953, he described what the unions wanted before the annual conference of Blue Cross and Blue Shield organizations.)

What It Is—The Cleveland plan entitles members to 730 days of hospital care, 610 more than the present limit. The extended time limit is typical of the new plans, which are often called catastrophic programs.

Extended coverage, say officials of the Blue Cross Commission and the Blue Shield Commission in Chicago, means an average monthly premium increase of $1 for individuals and $2 for families.

Extent—In the last two years, 12 state and two local Blue Cross organizations, with 43 per cent of the nation's subscribers, have introduced improved plans. Four states and four cities (plus Cleveland) are planning to make improved plans available this year.

Some companies with multiplant operations have introduced their own programs. General Electric Co.'s is administered by Metropolitan Life Insurance Co. GE contributes about one-third to one-half of each worker's premiums. A small amount is paid by the worker before the policy takes effect. The plan pays for $225 of hospital care, 85 per cent of extended hospital care and 75 per cent of out-of-hospital expenses due to illness or injury.

Ford Motor Co.'s plan for salaried employees combines prepayment of expenses through Blue Cross with the extended coverage of private insurance.

Of costs falling outside Blue Cross coverage, 80 per cent are paid by the insurance and 20 per cent by the individual. The insurance has a limit of $10,000 in a year for any one illness or accident and a top benefit of $20,000.

How Popular? — A New York survey, primarily of office workers, found 30 per cent covered by some type of catastrophic insurance. Only 21 per cent were covered the year before.

A survey by the Employers Association of Detroit indicates about 25 per cent of firms with more than 100 employees have the extra insurance. Of 31 companies employing less than 100 people, only four firms had a plan.

In Cleveland, a survey indicates about 5 per cent of the area's workers are covered by extended insurance plans.

Who Pays?—The Detroit report says that 15 of the 33 companies with plans share the costs with employees. Ten companies pay all costs. At eight firms, workers pay for their protection.

More than two-thirds of the Cleveland workers share the costs with their employers.

Loans $938 Million

The Export-Import Bank of Washington authorized 106 loans for $938 million in 28 countries the last six months of 1956. It was the busiest period the institution has had in 11 years.

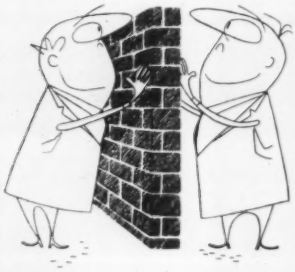
The largest credit was $500 million, the smallest $940, the bank said in its annual report to Congress.

Metals—With these credits, foreign countries will buy a variety of things in the U.S.: Jet aircraft, plastic producing and metalworking machinery, an atomic reactor, asphalt plants, a sulphuric acid plant, steel mills, electric power equipment, farm machinery, textile looms, water distribution equipment, oxygen producing machinery and agricultural and petroleum products.

Britain received the credit for $500 million to meet dollar requirements for petroleum as a result of the Suez Canal crisis. Brazil got $167 million for capital equipment. Argentina will buy transportation, industrial and agricultural equipment with $100 million, and Japan will spend $92.7 million for turbogenerating units, aircraft and cotton.

Boost Sales—The report showed that the credits will result in export sales of innumerable products by prime and subcontractors, large and small, all over the country.

Congress Building Merger Blockade



MARKETING managers with an eye to diversifying their firms' product lines will soon have a new blockade to overcome. How high it will be remains to be seen. The House has completed hearings on antimerger bills sponsored by Rep. Emanuel Celler (Dem., N. Y.), chairman of the Judiciary Antitrust Subcommittee, and Rep. Kenneth B. Keating (N. Y.), ranking Republican of the subcommittee.

Although strong opposition has been expressed by the National Association of Manufacturers and U.S. Chamber of Commerce, Congress is expected to approve legislation requiring 60 days' prenotification by companies planning to merge. Attorney General Herbert Brownell Jr. has assured the President's support.

Both NAM and U.S. Chamber of Commerce are well aware that prior notification to the Justice department is not the only intent of the law's sponsors. If that were all there is to it, everyone would be glad to see Justice department underlings saved the trouble of pouring through trade magazines trying to discover who married who last month.

The law's effect will be to put pressure on Justice, the Federal Trade Commission and other regulating agencies to increase their watchfulness for conglomerate and vertical mergers. No one is too upset about mergers within a single product line. In most cases, they strengthen, rather than weaken, competition. Example: The mergers in the auto field.

But conglomerate mergers are another thing: A steel manufacturer acquires a plastics company. An appliance maker goes into electronics.

A vertical merger gets even closer scrutiny: A steel company buys an iron ore producer. An appliance maker purchases control of a retail chain.

Justice stepped up its merger patrol after similar hearings in 1955 but still has given only 165 mergers "special inquiry" since 1953. It wasn't until fiscal 1957 that Justice got $1 million earmarked for merger investigations.

Now Congress will ask Justice to sharpen its efforts and provide it with the prenotification rule as a yardstick to use in checking to see what's really going on. Whether Congress gives Justice any money to follow up is another question. And how far does the administration really want Justice to go?

New Mobilization Order Cited

Official recognition of the revised defense mobilization order VII-7 (STEEL, Mar. 25, p. 57) by the Defense department has finally come. But an April Fool's Day speech in Los Angeles by Thomas Wolfe, office of the assistant secretary of defense (supply & logistics), does little to clear up the situation. He states Defense has worked for two years on programs which might cut U.S. vulnerability to nuclear attack and that the revised order merely brings mobilization plans up to date.

"The revised order does not portend any new twist or unexpected impact on defense contractors," he says, but adds that priority in any mobilization effort must go to "selected weapons systems." That is: Atomic weapons for immediate retaliation.

Of major importance to retaliation: "Balanced component inventories in assembly plants that might survive attack." The new policy, he concludes, is hedged by the funds available for inventory build-ups.

The new order succeeds the 1954 order and emphasizes the chance of nuclear attack on the U.S. It implies that there will be little opportunity for a mobilization program to bring us up to wartime strength. In the cards: Selection of firms producing urgent weapons and components for the full mobilization treatment; a gradual fade-out of interest in other companies having a less immediate place in the mobilization picture (STEEL, Apr. 1, p. 54).

More on Tungsten

Demand for tungsten "can easily be three times current consumption at a relatively early date," thinks Charles S. Segerstrom Jr., president, Nevada-Massachusetts Co., Tungsten, Nev. Reasons: 1. Commercial jet aircraft makers "who are definitely interested in our new alloys." 2. Military requirements (STEEL, Mar. 25, p. 52). Talking to the Senate Interior Appropriations Subcommittee, he warns: "Every tungsten mine in this country will be forced to shut down at once" if Congress appropriates no money for stockpiling. Although Congress continues to give lip service to its budget cutting mood, look for a reconsideration after the Business & Defense Services Administration's secret stockpile report is digested.

Tax Aid for Small Business? Unlikely

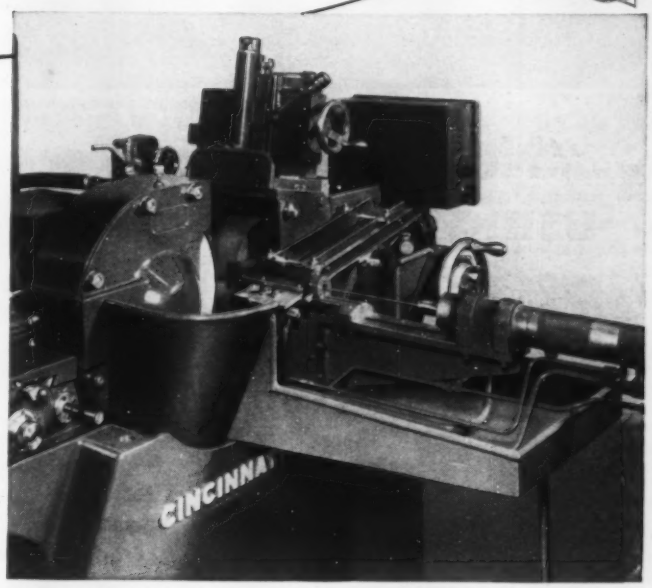
With passage of the bill to continue present corporate and excise taxes for another 15 months and the defeat of Sen. J. W. Fulbright's (Dem., Ark.) amendment to cut taxes on small corporations, Sen. John Sparkman (Dem., Ala.) is supposed to have obtained promises from opponents of the amendment that aid for small business will be allowed to come up again in this session of Congress. Outlook: Dim.

Cincinnati Filmatic Nos. 0 2 3 4 5 6 Centerless

The No. 0 is the machine for this job . . . grinding diameter and back taper on small drills

CINCINNATI

FILMATIC



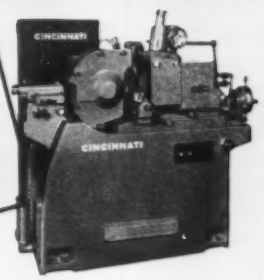
Low, low cost of machining operations is essential for competitive pricing of small drills ranging in size from No. 60 to ¼" diameter. One manufacturer does an excellent job by grinding the diameter and back taper on CINCINNATI® FILMATIC No. 0 Centerless Grinders.

The machine operates at a very high rate of production, grinding 16 drills per minute (768 per hour at 80% operating efficiency) to high standards of quality and at negligible cost.

You'll want to know why the No. 0 . . . one of six sizes of Cincinnati's line of standard Centerless Grinders . . . does such a fine job of grinding small parts. Spindle bearings are the exclusive FILMATIC type that never wear out; lubrication is automatic; regulating wheel speeds are infinitely variable; 5 hp drive; readily automated. Capacity: up to ½" diameter. Want more information? Look in Sweet's Machine Tool File, or write for a copy of catalog No. G-640-1.

CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO

CINCINNATI FILMATIC
No. 0 CENTERLESS
GRINDING MACHINE
CATALOG No. G-640-1

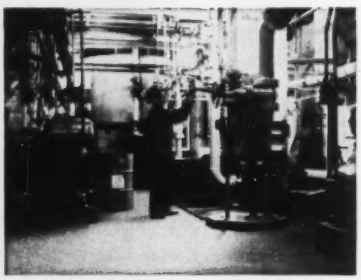


CINCINNATI

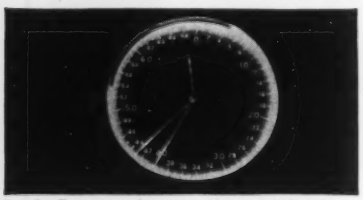
CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES • ROLL GRINDING MACHINES • SURFACE • GRINDING MACHINES • CHUCKING GRINDERS
MICRO-CENTRIC GRINDING MACHINES • CENTERLESS LAPPING MACHINES

Time exposure shows continuous motion of red-hot ingot as it travels through roller.

"Never replaced screwdown or nut using Cities Service E. P. Lubricants!"



Circulating System located on floor below mill, uses Cities Service E. P. Oils. Mill operates 160 hours a week, has never had lubrication failure.



Dial Gauges Accuracy to 1/32 of an inch. It is used by operators in the pulpit, who control the mill's 7000 horsepower and shape its steel to unusually fine tolerances for a blooming operation.

Ever since the installation of this blooming-slabbing mill at Pittsburgh Steel Company's Monessen Works, Cities Service E. P. Oils have been used for lubrication.

During that time, over 4,000,000 tons of steel have been run through the mill's huge rolls . . . but never once has the firm found it necessary to replace the screwdown, nut or any bearing due to lubrication failure.

A Pittsburgh Lubrication Engineer says: "Oils stay with the parts that must be lubricated and never give us a problem."

Where an inferior lubricant might be wiped away during the regular operation of the mill, Cities Service E. P. Oil withstands continuous operation. In addition, the oil can be centrifuged and yet not lose its additive.

Pittsburgh Steel is one of an increasing number of steel manufacturers who report outstanding results with Cities Service Lubricants. A Cities Service Lubrication Engineer will be happy to supply all the reasons. Or, if you prefer, write Cities Service Oil Company, Sixty Wall Tower, New York 5, New York.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Who Employs Scientists and Engineers in Great Britain

	Scientists	Engineers	Totals
Manufacturing industry	17,050	37,000	54,050
Nationalized industries	2,420	14,660	17,080
Central government	5,800	8,050	13,850
Local authorities	350	6,330	6,680
Education	25,610	2,430	28,040
Estimated in other employment	5,000	10,000	15,000
Totals	56,230	78,470	134,700

Source: British Ministry of Labor.

UK Seeks More Technicians

Plans to spend $196 million during next five years to increase capacity of technical and engineering schools and provide scholarships to entice more students

ALARMED by its shortage of scientists and engineers for its expanding industry, the British government plans to spend $196 million during the next five years to enlarge its technical schools and increase their student output by 50 per cent. The current graduation rate is 9500 yearly.

Gains—A Labor Ministry questionnaire sent to British industry revealed an anticipated need for 45,000 new scientists and engineers by 1959, an increase of one-third over the estimated 134,700 now employed. The survey did not include technical employees of British firms abroad, nor any working in Overseas Civil Service.

This expansion, says the Labor Ministry, "must be backed by an adequate system of financial aid. Students proposing to attend courses leading to a technological award will be eligible for technical state scholarships, and the number will be raised as these courses develop."

More Math—In Scotland, the pamphlet says, "the great majority of boys and girls study both mathematics and science for at least three years and the number taking these subjects up to the level of the Scottish Leaving Certificate has increased steadily."

Steel Payroll at Record High

During January the iron and steel industry's estimated total payroll was a record $360.4 million, says the American Iron & Steel Institute. The average hourly payroll cost was $2.831, also a record.

Total employment for January was estimated at 677,600, compared with 688,600 in December and 681,100 in January last year. The decline resulted largely from changes made in employment data to exclude workers engaged in fabricating.

Wage earners worked an average of 40.2 hours a week in January, against 37.7 hours in December and 39.5 hours in January, 1956. The record payroll of $360.4 million compares with $347.2 million in December and $329.1 million in January, 1956.

The $2.831 average hourly payroll cost (including a 3-cent, cost-of-living increase) compares with $2.804 in December and $2.617 in January last year. It does not include an average hourly cost of 29 cents for pensions, social security and insurance.

U.S. of Europe?

Six countries in West Europe sign Euratom, Euromarket pacts; believed step toward union

TOLLING of the bell in Rome's ancient Capitoline Tower, signaling the "Euratom" and "Euromarket" treaties signed by the six nations of "Little Europe," may have also spelled the doom of traditional nationalistic barriers and paved the way for an ultimate United States of Europe.

That is the optimistic view of the ceremony which drew crowds which stood and cheered in the rain. Under the treaties, France, West Germany, Italy, Belgium, the Netherlands and Luxembourg are committed to pool their research and development of atomic power for peace and to create a tariff-free, common market for all goods produced.

Barriers—Some hurdles remain before the pacts begin to function. Each must be ratified by the national assemblies of the participating nations. But there is little opposition except among Communist elements. Proponents expect each nation to enact the necessary legislation by the end of the summer.

Statesmen toiled more than two years to draft the treaties. Old economic fears and nationalistic prejudices were compromised and protections for the smaller nations were written in until all were satisfied.

Prototype—Patterned after the European Coal & Steel Community, which has successfully produced and distributed in a common market, Euromarket calls for the slow elimination of tariffs and custom duties among the six nations over 17 years.

Common tariffs based on averages of existing ones will be

adopted on outside goods. Other provisions: 1. Foreign exchange will eventually be eliminated. 2. Cartels will be discontinued. 3. Capital and labor will move freely throughout the area. 4. National economies will be integrated.

Spurred by Suez—Euratom provisions were agreed upon much quicker than those of Euromarket. Realizing that Western Europe could be placed at the mercy of Middle East oil politics as a result of the Suez Canal situation, the six nations agreed:

1. To a common market for nuclear equipment and raw material. 2. To pool their technical efforts and research. 3. To concentrate on the development of nuclear power for electrical and industrial use.

Supranational — Euratom and Euromarket will be operated by a Council of Ministers representing each government. There will be an Advisory Committee, a Court of Justice and many other agencies to supervise and implement operations. All participants will be bound by decisions of these groups.

In France, the Mendes-France Radical Socialists are committed opponents, but their strength is doubtful. Some elements of German industry are opposed to Euratom but enthusiastic about Euromarket. Observers agree that if France and Germany ratify the treaties so will the others.

Effect—The possibility that less industrialized areas will suffer from loss of protective tariffs has caused some misgivings. However, the belief is that competition will improve business.

Growth in New Zealand

New Zealand is in the midst of dramatic economic growth as a result of population gains.

More than 2 million now inhabit the islands, compared with 1,861,000 in 1948. "That means new opportunities for industry," says Joseph Spitzer, joint managing director of Rex Mfg. Co. Ltd., Auckland. He has been visiting the U.S. to find new products in the houseware, small appliance and plumbing fields which his stamping company can manufacture.

The dominion today has 16,000 jobs going begging, says Mr. Spitzer. Unemployment is nil.

Olin Set To Roll Aluminum

How and why the chemical company plans integrated production by next year in a joint venture with Revere Brass, a competitor, to reduce alumina from Surinam bauxite

DOES the aluminum industry need another integrated producer? Does it need higher quality and service? Can a new producer find a market?

Olin Mathieson Chemical Corp., Baltimore, decided last year that the answer to all three questions is "Yes," and it is initiating a program which will see it become an integrated aluminum producer by the first quarter of 1958 when its new aluminum division will be fully operating.

Steps—Once the decision was made, Olin Mathieson got busy: 1. It joined with Revere Copper & Brass Inc., New York, to form Ormet Corp. (originally called Olin Revere Metals Corp.) and helped raise $231 million to finance the new firm. It will produce 350,000 tons of alumina from Surinam (Dutch Guiana) bauxite, which will make 180,000 tons of aluminum annually. 2. It built a 120,000 ton capacity aluminum rolling mill at Omal, O. 3. It bought Southern Electrical Corp., Chattanooga, Tenn., producer of aluminum electric wire and cable. Its annual sales: About $15 million.

Ormet Corp. (owned 50-50 by the parent firms) will handle delivery of bauxite from Surinam to its reduction plant at Burnside, La. It will produce 120,000 tons of aluminum for Olin Mathieson and 60,000 tons for Revere annually. Molten metal will be delivered to Olin Mathieson's new rolling mill.

Ways Part—The joint venture stops at the end of the ingot line. Salesmen for the Olin aluminum division will be selling hard against the Revere aluminum sales force, and all other producers of aluminum mill, extruded and wire and cable products.

Thomas S. Nichols, president, Olin Mathieson, says: "The new corporation (Ormet Corp.) offers us the advantage of a greatly increased supply of primary aluminum at a significantly lower cost per ton."

Battle — Competition will be fierce. Reasons: Olin Mathieson

Walter F. O'Connell (left) and Albert J. Berdis talk over aluminum problems

has been, and still is, thoroughly canvassing the primary aluminum makers for management talent. The firm has "found" management personnel among the ranks of aluminum makers and steel and other metal producers. Result: The Big Three domestic producers will have no love for the upstart.

Walter F. O'Connell, executive vice president, Olin Mathieson, will head up Ormet Corp. Albert J. Berdis, Olin Mathieson's vice president in charge of fabricating, will run the company's new aluminum division. Mr. Berdis was formerly general superintendent of the Fairless Works of U.S. Steel Corp.

Eyes Open—Says Mr. Berdis: "We are not entering the aluminum field as the big 'I' or with a puffed head. We know we still have things to learn. But we are absolutely convinced on the basis of our studies that we can provide a new level of quality and service."

Stauffer Boosts Capacity

Stauffer Chemical Co., New York, is expanding zirconium tetrachloride and silicon tetrachloride production facilities at Niagara Falls, N. Y.

Zirconium tetrachloride capacity will be increased by 40 per cent, silicon tetrachloride 20 per cent.

Worthington Expands Plant

Over $600,000 is being invested by Worthington Corp., Harrison, N. J., in the expansion of its Buffalo plant.

Wheeling Raises Capacity

Capital expenditures of Wheeling Steel Corp., Wheeling, W. Va., this year will be about $35 million, nearly twice the sum spent in 1956 to increase ingot capacity 70,000 net tons.

John L. Neudoerfer, president, says improvements include a high-speed, 5-stand cold mill, annealing furnaces with increased capacity and a high-speed, 2-stand coil temper mill. By the end of 1958, he predicts, another 200,000 tons of steel will be added to the company's annual capacity.

Know Your New Product's Marketing Scope

Data Necessary	SOURCES: Published	Field Surveys	Company Records
MARKET CHARACTERISTICS			
Over-all size	X	X	
Estimated participation	X	X	
Location	X		
Buying patterns	X	X	
Market trends	X	X	
Buying habits		X	
PRODUCT INFORMATION			
Pricing		X	
Style preferences		X	X
Performance preferences		X	X
Specific advantages		X	X
Specific disadvantages		X	X
DISTRIBUTION FACTORS			
Which channels	X	X	X
Discount structures	X	X	X
COMPETITIVE CONSIDERATIONS			
How many competitors	X		X
Direct competitive products	X		X
Substitute products	X	X	X
Buyer preferences	X	X	X

Launching a New Product

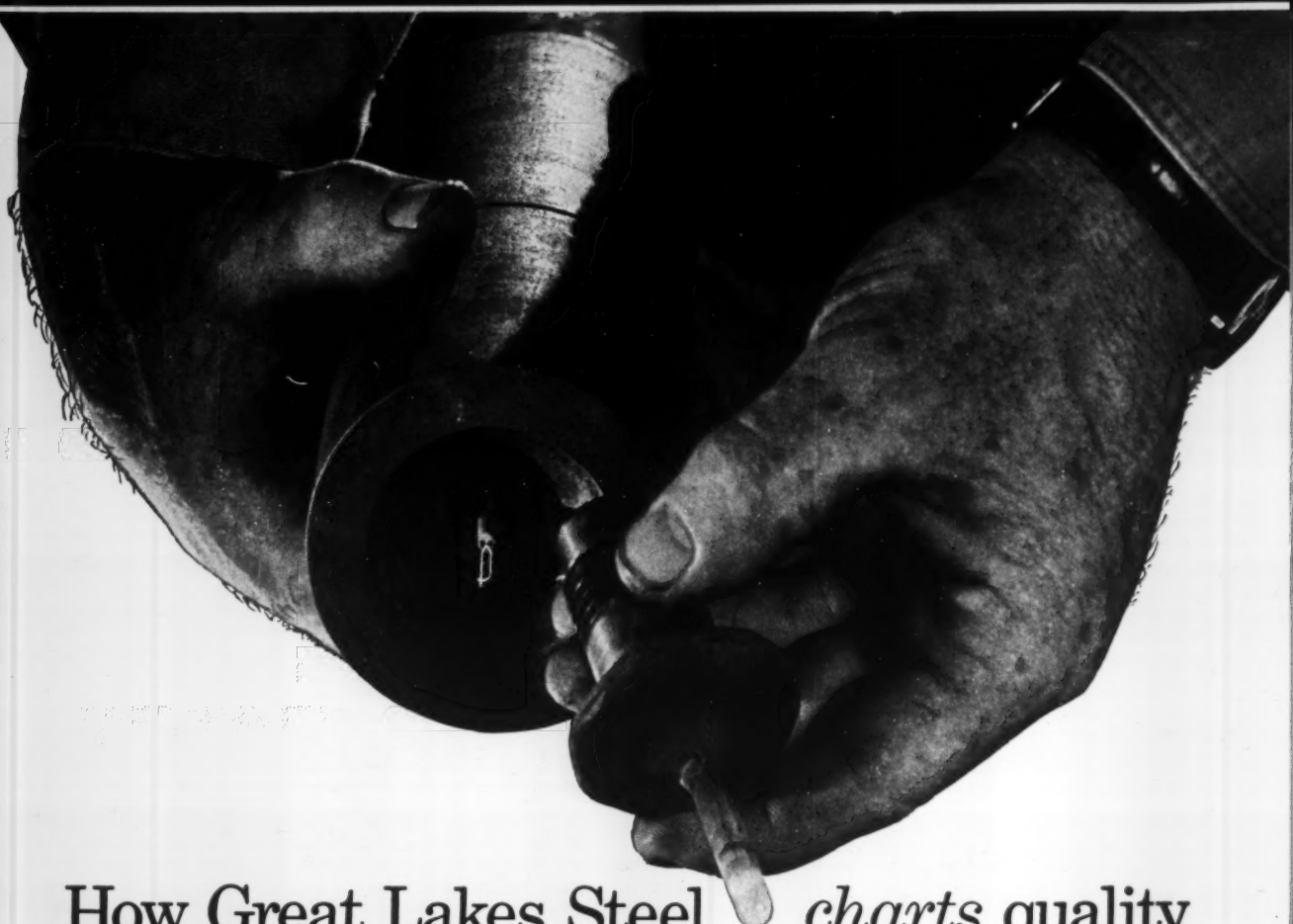
WHAT chance of success does your new product have? Only one in five, according to a survey of 200 leading packaging goods manufacturers.

That success ratio does not include the products or ideas which were abandoned before they reached the distribution channel, points out the New York research firm which conducted the study. Major reasons for failure are: Lack of well thought-out marketing plans; lack of pretesting the product with consumers; insufficient market research; insufficient product research.

Five Basic Queries—To increase your new product's chances for success, you should answer five basic marketing questions, R. H. Darby of Hazard Advertising Co. Inc. told a recent American Management Association conference:

1. How big is the market?
2. What are its characteristics?
3. What are the competitive factors involved?
4. What share of the market can you expect initially, in the future?
5. How can you enter the market most effectively?

Sources—You can get this information from: 1. Published information — government agencies, trade associations, Chambers of Commerce, trade and business journals, financial institutions, private research organizations. 2. Field studies directed to consumers. 3. Your own company records.



How Great Lakes Steel *charts* quality

Left: Thermocouple is inserted into an open-hearth furnace to check temperature of heat. Right: Multiple indicator records open-hearth temperature.

This view shows 12 of Great Lakes 17 open-hearth furnaces. Bright spots are furnaces being charged with pig iron and scrap. The open-hearth process takes from 10 to 12 hours.

This is the business end of a thermocouple, the rugged yet delicately accurate device that measures temperature in an open-hearth furnace. The two fine wires you see above, inside the casing, absorb heat and transmit it as an electrical current to be charted by recording potentiometers.

No chance for guesswork here—through eleven long hours the rising temperature of what will be 500 tons of Great Lakes open-hearth steel is meticulously controlled. Then, at exactly the right time and the right temperature, the glowing molten metal gushes into ladles for pouring into ingots.

The slender, spidery lines on the chart assure another heat of high and uniform quality steel. Quality that is checked and rechecked at every step to assure that customer specifications are met precisely.

Why don't we get together and talk over your steel needs? Some time soon?

GREAT LAKES STEEL CORPORATION

Detroit 29, Michigan • Division of

NATIONAL STEEL CORPORATION

District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.

Big Charge for Autodom

Auto makers turn to electrostatic painting to cut costs, despite court battles over patent rights. The processes are said to save labor, paint and space

ELECTROSTATIC painting applications in the auto industry are increasing 15 per cent this year.

Chassis, radiators, bodies and dozens of hidden parts are being electrocoated instead of being passed through dip tanks.

Ford Motor Co. plans to electrocoat steering gear parts at its Indianapolis plant. It is setting up a four-station experimental line to paint large body panels at its Kansas City, Mo., facility.

Ransburg Electro-Coating Corp., Indianapolis, is installing its new split bell unit at Mitchell-Bentley Corp.'s plant in Ionia, Mich. M-B is prime coating station wagon bodies electrostatically.

Thrifty—Savings in paint, space and manpower are big reasons for car builders to put in electrostatic spray booths.

D. J. Davis, Ford's manufacturing vice president reports: "This method requires smaller spray booths, releasing floor space for other operations. In one application (horn painting), the equipment occupies only one-third as much area as equipment for dip painting."

Mitchell - Bentley expects the Ransburg process to cut its paint costs 50 per cent. Chrysler Corp. has cut costs 30 per cent with an older Ransburg process.

Union Watches—A supplier who makes window molding and trim parts says he has cut his paint crew from 23 to 13 by using electrostatic painting. His paint consumption has dropped 80 per cent.

Less overspray does away with the need for expensive water recovery baths and cuts down on inplant heat losses. Maintenance is easier.

Theory—The basic theory behind electrostatic painting is simple. The paint carries a positive electrical charge and is attracted to the negatively charged part which is grounded on the conveyor.

There are several ways of doing this. One system shoots the paint out under air pressure, and it's charged by passing through a grid field. The electrostatic action breaks the paint up into a mist.

Another method spins the paint out under centrifugal pressure, charging it at the edge of a spinning disc or cone. The spray is so fine it is almost invisible until it starts covering the workpiece. This setup seems to hold most hope for the future. Studebaker-Packard Corp. uses a Ransburg No. 2 process (spinning) on its chassis line. Daily paint consumption has dropped from 14.5 to 1.5 drums.

Problems — Electrostatic painting is not troublefree. The charged paint particles aren't attracted to deep holes or crevices since they stick to the first part they touch.

Painting with different colors means fast switches in paint or costly extra equipment.

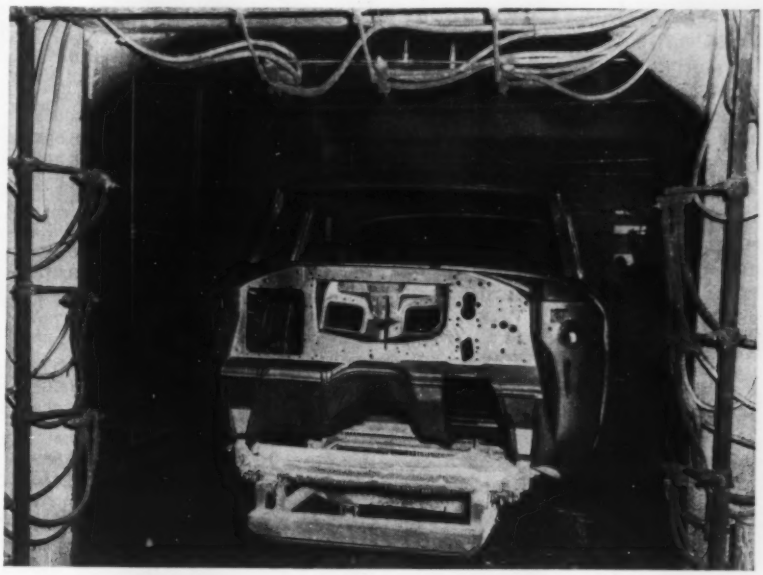
In addition, the high charges on grids (90,000 to 120,000 volts) make for some safety problems.

Squabble—Car builders haven't been as eager as other industries to adopt the process because of a patent situation.

The method and original equipment designs first were developed by Harold Ransburg during World War II. Today, his firm is the largest in the business, leasing units to an estimated 65 per cent of the market. Total industry sales almost doubled in 1956 and may repeat this year.

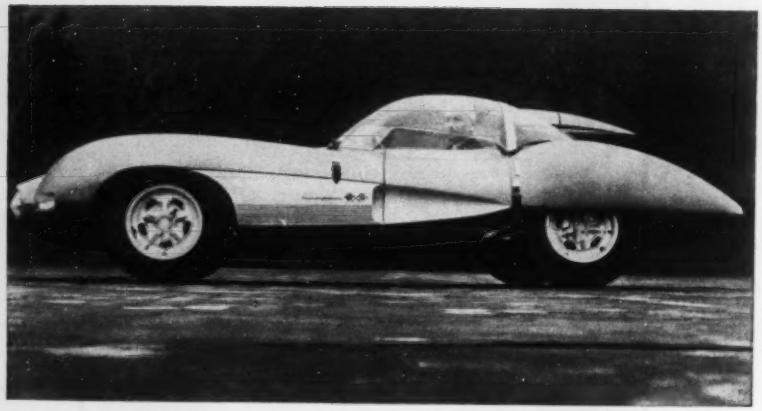
Won't Sell — Ford and General Motors, however, don't like to lease anything, and Ransburg doesn't sell its equipment.

So the auto makers' story goes something like this: "Ransburg



Electrostatic painting of bodies at Plymouth

(Material in this department is protected by copyright, and its use in any form without permission is prohibited.)



Chevrolet Introduces the Corvette Supersport
This experimental job has a magnesium alloy body and a tubular frame. The radiator is aluminum with an oil cooler in the bottom. Chevy hopes to test the Corvette SS at Sebring, Fla., this month

has patents on equipment, but not on the basic theory behind electrostatic painting."

As a result, the two firms have developed their own methods and equipment, and the whole deal is clouded by a series of patent suits. Four or five smaller equipment makers are watching from the sidelines.

Young Makes New Spring

L. A. Young Spring & Wire Corp., Detroit, has acquired license rights to make the Neg'ator constant force spring for automotive use.

Thomas Couper, general vice president, says the firm will test the spring unit for use in car windows, seat tracks, rear deck and hood mechanisms, brakes, throttles and convertible tops.

The constant force spring resembles a roll of metal tape. It can be uncoiled to any length with no increase or decrease in applied force. The full force of the spring is held through the return stroke.

Ford Publishes Book

Ford Motor Co. has entered the publishing business in a small way. It has distributed 2000 copies of a book which contains complete engineering measurements for its 1957 truck line.

The specifications go to body builders who have to fit special bodies on truck chassis. The complete layouts mean customers will be able to get their trucks the way they want them in a hurry.

This time lag has been a problem in the truck industry, says Howard W. Cook, Ford division fleet sales manager.

Too often, a customer has to wait while a body shop figures out just where and how it can fit a special body onto a chassis.

Ford now has 28 series and more than 200 different truck models, reports Mr. Cook, but the need for special chassis and body modifications continues to grow.

Truck operators have found they can save money by tailoring trucks to fit a particular job.

U.S. Auto Output

Passenger Only	1957	1956
January	642,089	612,078
February	571,098	555,596
March	579,200†	575,260
3 Mo. Total	1,792,387†	1,742,934
April		547,617
May		471,617
June		430,373
July		448,876
August		402,575
September		190,726
October		389,061
November		581,803
December		597,226
Total		5,802,808

Week Ended	1957	1956
Mar. 2	140,362	132,889
Mar. 9	140,161	132,840
Mar. 16	141,038	131,207
Mar. 23	138,646	131,287
Mar. 30	131,015†	125,850
Apr. 6	128,000*	129,829

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.

Small Tires Are Leakers

Several tire companies have reported that more 14-in. tires are being returned because of bead leaks.

The situation is so bad that most manufacturers say they can't make warranty adjustments on tires which show obvious damage from mounting or dismounting.

Most of the trouble seems to stem from service stations which are trying to use 15-in. tire equipment to work on 14-in. rims, say Goodyear Tire & Rubber Co. and B. F. Goodrich Co.

The problem is complicated because there are three different types of rims, and each one calls for a special mounting procedure. Service station people apparently find the smaller tire is harder to handle.

Ford Metallizes Stack

The largest single job of metallizing has been done on a vent stack for Ford's Rouge glass plant furnace. To be erected this month, it is 71 ft high.

Dix Engineering Co. Inc., Detroit, did the ten-day job with the Metco metallizing system.

Knowles B. Smith, executive vice president for Dix, says the firm used more than 1000 lb of aluminum wire on the job. About 30,000 lb of blast cleaning abrasive were used.

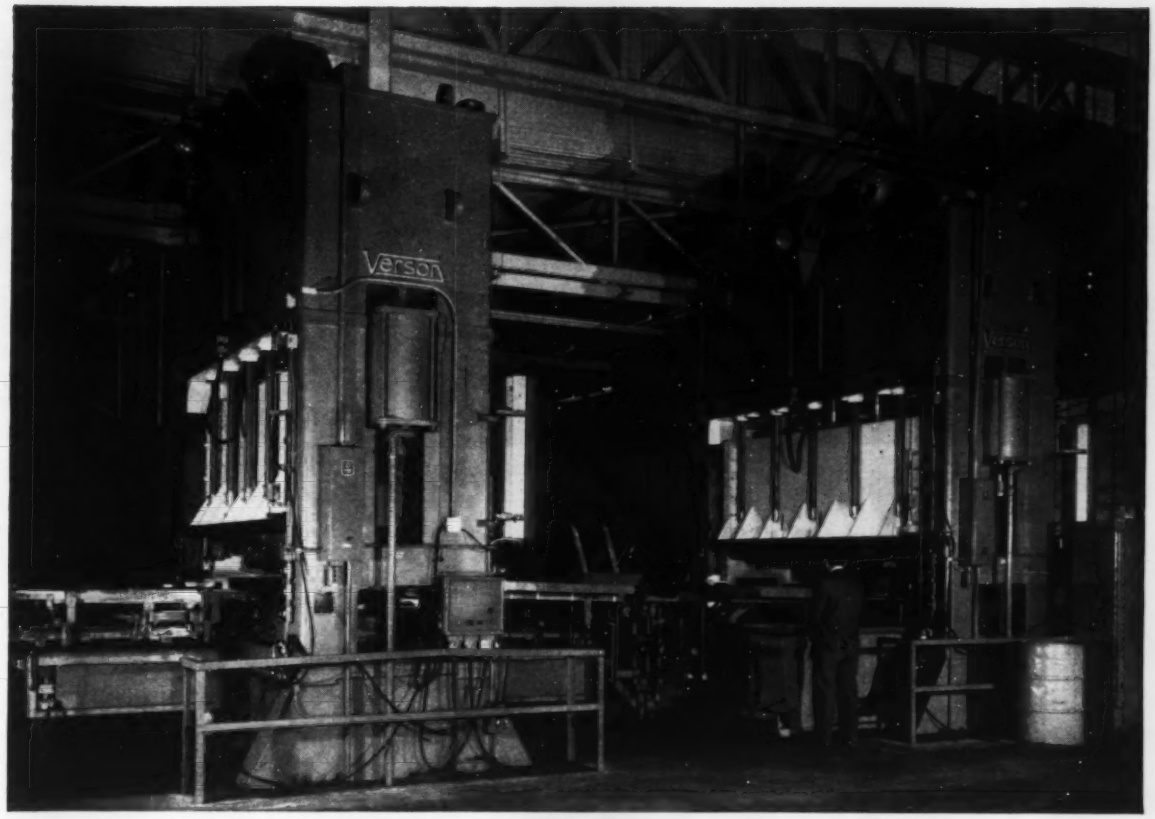
Since the stack was too large to do in one piece, Dix took each of the three sections into the hold of a ship where there was room to work.

Mr. Smith estimates the coating will last 20 years and will be some 50 per cent cheaper than having to have the stack repainted each year.

Exhaust Notes

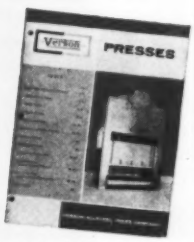
• Ford Motor Co. reports it is spending $250 million to bring out its Edsel line. Incidentally, the car will have 123.5-in. wheelbase, according to inside dopesters.

• Chrysler Corp. supposedly is seeking a year and a half lead time on smaller parts such as fasteners, brackets and items which won't change from one model to next.



Two 400 ton Verson Presses

perform as one production unit to manufacture automatic dryer bodies



Catalog G-56 describes the entire Verson line and gives design details and specifications. Write for your copy, today.

The two 400 ton Verson eccentric presses shown above, integrated with automatic handling equipment and controlled by one operator, perform as a single production unit in the manufacture of automatic clothes dryer bodies for a leading appliance manufacturer. The press on the left blanks and forms the dryer body and draws the front face with door opening. The parts then move automatically to the press on the right for flanging and punching operations. Speed is 14 strokes per minute.

Verson presses are engineered to become an integral part of the production process in which they are used. If you make stampings of any kind, this approach to your problems can mean big savings. Send an outline of your requirements today and put real production know-how to work for *you!*

A Verson Press for every job from 60 tons up.

TRADE Verson MARK

ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

VERSON ALLSTEEL PRESS CO.

9318 S. KENWOOD AVENUE, CHICAGO 19, ILLINOIS • 8300 S. CENTRAL EXPRESSWAY, DALLAS, TEXAS

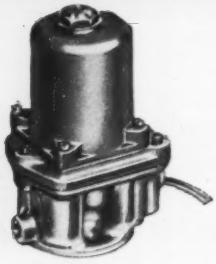
MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES

NEW Ross Starline

air control valve series

NEW long life

WHITE STAR
SPOOL SOLENOID



GOLD STAR
OIL-IMMERSED SOLENOID

BLUE STAR MV

BLUE STAR TD

BLUE STAR WV

NEW match any head to any valve body!

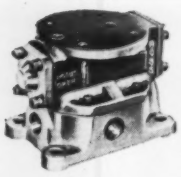
STRAIGHTWAY NORMALLY OPEN

STRAIGHTWAY NORMALLY CLOSED

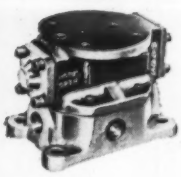
3 WAY NORMALLY OPEN

3 WAY NORMALLY CLOSED

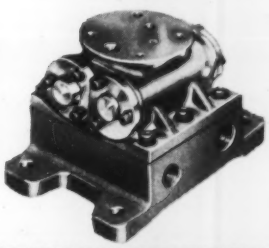
3 WAY NORMALLY OPEN



3 WAY NORMALLY CLOSED



4 WAY



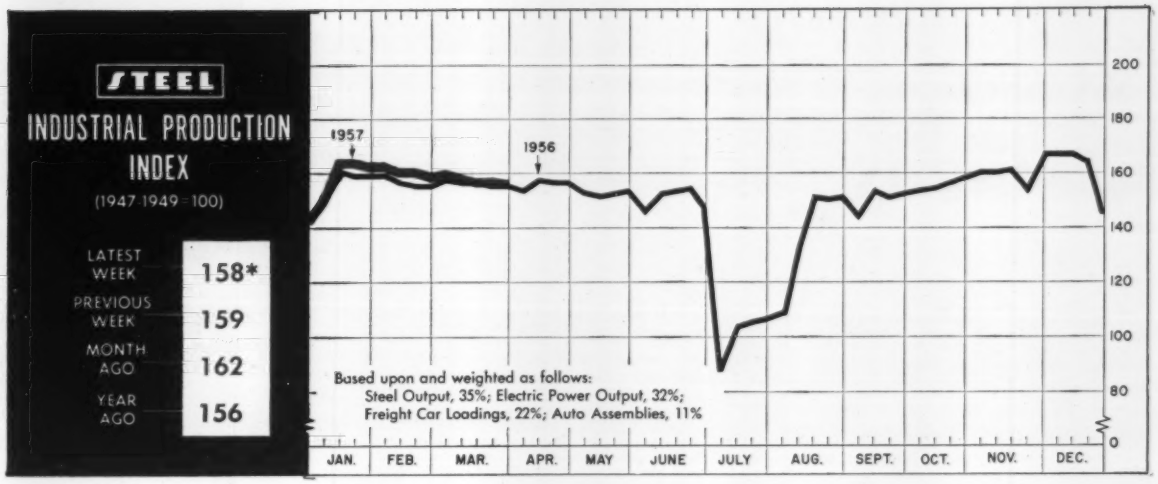
Tests indicate a trouble-free life of over 25 million cycles for valves with the spool solenoid pilot section, and *more than 40 million for all other Starline* valves shown.

Heads and bodies are completely and instantly interchangeable. Sizes from ¼" to 1¼". Even *more* Starline models coming later. Write for Starline data file.

A Galaxy of New Air-Control Stars Are Coming Your Way From

Ross OPERATING VALVE COMPANY

132 EAST GOLDEN GATE AVENUE • DETROIT 3, MICHIGAN



Week ended Mar. 30.

Consumer Has Buying Power, Will Use It

IT IS becoming more and more apparent that the consumer holds the key to whether the national economy will set a record this year. He has the spending power to turn the trick, but will he use it?

Ira T. Ellis, economist for E. I. du Pont de Nemours & Co., thinks he will. Mr. Ellis told the National Industrial Conference Board's third California meeting that personal income this year will rise 5 per cent, or $13 billion, above the 1956 total on the basis of a 1 million rise in employment and higher wages. Spending will rise about 5 per cent, with a 6 per cent increase for durable goods. The rate of savings will not increase, he feels, but the amount will be almost a third higher than it was in 1956. He estimates that half the rise in durable spending will be for new automobiles.

On a Par—Almost of equal importance with consumer spending will be the demands of business for plant and equipment. But while consumer spending will remain firm throughout the year, outlays for capital goods likely will turn down toward year end, says Charles E. Young, economist for Weyerhaeuser Timber Co. He told the conference that capital expenditures for the year will set an all-time high despite this decline. After the pause, the tempo will increase again sometime in 1958 and carry to new peaks.

Not all economists at the conference were so enthusiastic. Money troubles will plague us even more this year than last, states Walter R. Bimson, chairman, Valley National Bank, Phoenix, Ariz. Demand for money will be as great as but not greater than it was last year. But commercial banks already are supplying all the credit they have available. There is no room for expansion of credit. So borrowers will have a harder time getting money. "While we may be sure the Federal Reserve System will supply the market with ade-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,344[1]	2,364	2,406
Electric Power Distributed (million kw-hr)	11,800[1]	11,723	10,992
Bituminous Coal Output (1000 tons)	10,255[1]	10,180	9,961
Petroleum Production (daily avg—1000 bbl)	7,750[1]	7,818	7,149
Construction Volume (*ENR*—millions)	$359.0	$375.9	$459.5
Auto, Truck Output, U. S., Canada (*Ward's*)	165,238[1]	172,710	159,958
TRADE			
Freight Car Loadings (1000 cars)	680[1]	686	725
Business Failures (Dun & Bradstreet)	318	301	208
Currency in Circulation (millions)[3]	$30,502	$30,589	$30,249
Dept. Store Sales (changes from year ago)[3]	+1%	+2%	+9%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$22,827	$26,123	$22,117
Federal Gross Debt (billions)	$272.0	$274.8	$276.3
Bond Volume, NYSE (millions)	$17.7	$17.4	$15.9
Stocks Sales, NYSE (thousands of shares)	8,549	8,061	11,391
Loans and Investments (billions)[4]	$86.7	$85.7	$86.5
U. S. Govt. Obligations Held (billions)[4]	$26.0	$25.7	$28.7
PRICES			
STEEL's Finished Steel Price Index[5]	227.41	227.41	209.10
STEEL's Nonferrous Metal Price Index[6]	239.3	239.1	278.3
All Commodities[7]	117.0	116.9	112.9
Commodities Other Than Farm & Foods[7]	125.3	125.3	120.8

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957, 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

Coming

April 15

IN

STEEL

Profit Sharing . . .

HOW IT WORKS—

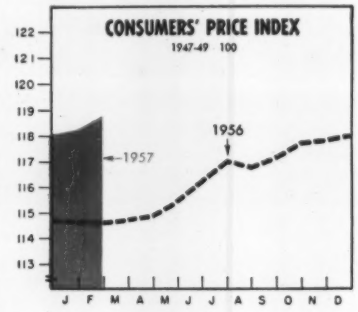
WHERE IT'S WORKING—

HOW IT MIGHT WORK FOR YOU

Today's higher costs put a premium on efficiency. To promote efficiency, some companies find profit sharing is the answer.

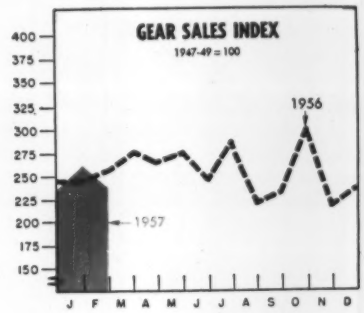
In its Apr. 15 issue, STEEL outlines a variety of profit-sharing plans, telling how they succeed or why they fail—how one profit-sharing company raised productivity by 305 per cent, how another increased profits by 100 per cent, how a third gave up after an abortive try.

This is the third article in STEEL's 1957 Program for Management.



	1957	1956	1955
Jan.	118.2	114.6	114.3
Feb.	118.7	114.6	114.3
Mar.	...	114.7	114.3
Apr.	...	114.9	114.2
May	...	115.4	114.2
June	...	116.2	114.4
July	...	117.0	114.7
Aug.	...	116.8	114.5
Sept.	...	117.1	114.9
Oct.	...	117.7	114.9
Nov.	...	117.8	115.0
Dec.	...	118.0	114.7

U.S. Bureau of Labor Statistics



	1957	1956	1955
Jan.	259.3	245.5	140.9
Feb.	239.5	256.2	148.5
Mar.	...	276.5	172.8
Apr.	...	264.7	179.5
May	...	275.6	205.2
June	...	245.4	193.5
July	...	286.7	201.7
Aug.	...	219.5	217.6
Sept.	...	230.5	246.5
Oct.	...	299.8	227.6
Nov.	...	216.2	210.4
Dec.	...	235.7	245.5

American Gear Mfrs. Assn.

Charts copyright, 1957, STEEL.

quate funds in temporary times of need . . . it is quite unlikely it will loosen its controls as long as it believes there is a need to curb inflation or overexpansion. I suspect that there will be no relief from this source in the immediate months ahead."

Anti-Inflation—Neil H. Jacoby, dean of the school of Business Administration, University of California, Los Angeles, believes this inflation can be curbed. He offers a six-point program:

1. A presidential declaration that a stable consumer price index will be the primary guide to federal policy.
2. Adoption of a dynamic concept of full employment—96 per cent of the work force.
3. Highly flexible monetary policies on the part of the Federal Reserve System.
4. Highly flexible federal tax and spending policies.
5. Appointment of a National Monetary & Credit Commission to recommend changes in the U.S. financial system to make all parts of it respond rapidly to monetary policies.
6. Extension of the antitrust laws to all economic activities so that vigorous competition will make the whole price system more flexible.

Prices March On

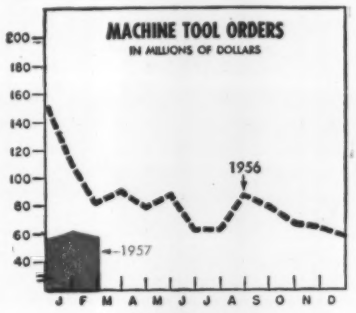
The rise of a number of price indexes is evidence that inflation has not been tamed. Consumer prices advanced by 0.4 per cent in February to a new high of 118.7 per cent of the 1947-1949 base (see chart above). Mr. Ellis of Du Pont predicts they will rise to 2 per cent above the 1956 level before the year is over.

Wholesale prices will advance more sharply (see page 59). In May alone, the increase in tin plate prices will boost the index 0.3 percentage point. Major canmakers have announced a hike of about 4 per cent which will be effective May 1. By December, the government's wholesale price index will be 120.2 (1947-1949=100). It was 117 in February.

Industry Roll Call

Monthly reports from industry associations confirm that business activity remained high during the first quarter. Here are a few:

Structural Steel — Bookings in February dipped to 265,894 tons,



	1957	1956	1955
Jan.	7,380	10,244	4,973
Feb.	8,373	12,163	5,616
Mar.	....	7,025	7,345
Apr.	....	8,803	7,639
May	....	3,620	6,205
June	....	4,748	5,812
July	....	4,140	4,338
Aug.	....	6,722	6,273
Sept.	....	3,057	8,351
Oct.	....	8,741	9,575
Nov.	....	3,986	6,180
Dec.	....	5,858	11,105

*Not including new orders for steel mill furnaces.
Industrial Heating Equipment Assn. Inc.

(Thousands of dollars)

	New Orders 1957	New Orders 1956	Shipments 1957	Shipments 1956
Jan.	63,250	109,550	76,550	54,600
Feb.	58,150*	81,300	78,100*	64,600
Mar.	.....	89,500	.....	74,150
Apr.	.....	79,300	.....	71,800
May	.....	87,100	.....	76,800
June	.....	61,850	.....	76,250
July	.....	61,900	.....	65,150
Aug.	.....	87,500	.....	75,100
Sept.	.....	78,450	.....	71,100
Oct.	.....	66,100	.....	89,750
Nov.	.....	64,250	.....	81,700
Dec.	.....	57,200	.....	85,150
Totals	.....	924,000	.....	886,150

*Preliminary.
National Machine Tool Builders' Assn.

falling beneath shipments (278,453 tons) for the first time since December, 1954, but backlogs remain nearly 1 million tons above the year-ago level.

Heat Treating—Billings for February totaled $3,337,900, up 6.8 per cent from a year ago.

Foundry Equipment — January net orders rose to 117.9 (1947-1949 =100), a 2.3 percentage point rise over December's. The 1956 average was 149.

Gears—Sales dropped from 259.3 (1947-1949=100) in January to 239.5 in February. The 1956 average was 244.2 (see chart, page 78).

Industrial Supplies—The seasonally adjusted index of new orders dipped 2 points to 219 per cent of the July, 1948, base. The 1956 average was 168.5.

Material Handling—Bookings for this equipment in January advanced to 126.34 per cent of the 1954 average from December's 117.76. Manufacturers predict 1957 will equal 1956 or exceed it by 5 per cent.

Industrial Furnaces—Excluding steel mill furnaces, new orders amounted to $8,373,120 in February, up from the previous month's figure but below the year-ago level. Induction and dielectric furnace orders increased 82 per cent over the comparable 1956 month. (See chart above.)

Steel Forgings—The Department of Commerce reports that shipments in January rose to 147,689 tons from December's 129,588 tons. Backlogs shrank a little over 1000 tons to 536,872 tons.

Trends Fore and Aft

- Demand for bituminous coal will rise to 521 million tons this year, compared with 500 million tons last year, estimates the National Coal Association.
- The Department of Labor reports that employers in 90 per cent of the 149 major areas surveyed expect slight to moderate employment increases to mid-May. Heaviest labor needs in most areas will be in the construction industry.
- William C. Stolk, president of American Can Co., predicts his firm's output will increase 9 per cent this year. That's well above the annual average increase for the industry in recent years.
- Electric power needs in 1963 will total 450 billion kw-hr, 12.5 per cent higher than the estimate made three years ago, says Westinghouse Electric Corp.

Shorten load handling time with a READING CRANE!

● One well-known stove manufacturer wanted to speed-up assembly—a call to Reading Engineers led to complete solution. A 10-ton, double I-Beam, cab-controlled Reading Crane brought even better results than expected.

Get complete information from our latest 16-page bulletin "The Why and How of Faster Production". Write today.

READING CRANE & HOIST CORP.
CHAIN HOISTS • OVERHEAD TRAVELING CRANES • ELECTRIC HOISTS
2102 ADAMS ST., READING, PA.

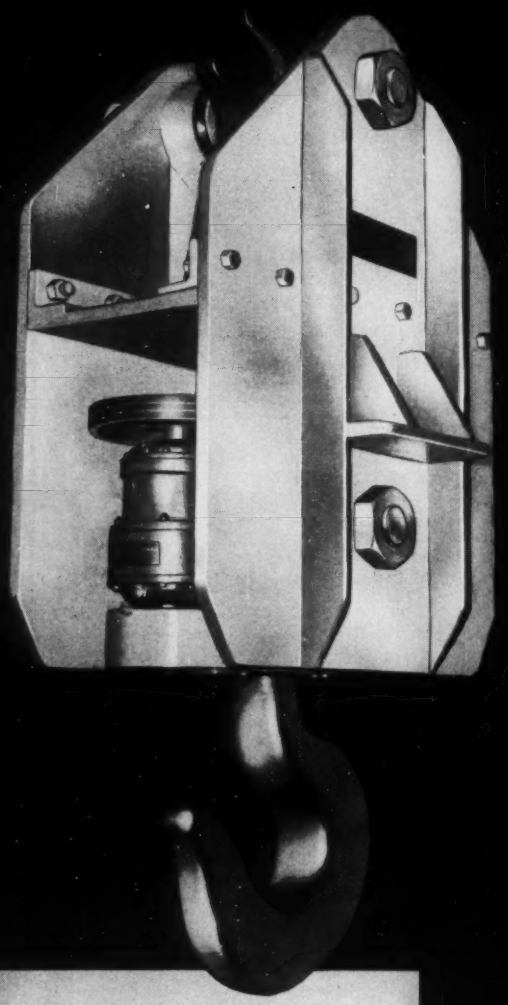
WARD STEEL CO.
We specialize in FINISHED STEEL BARS—TUBES—STRIP
PROMPT WAREHOUSE SERVICE ONLY
Most Complete Stock in America of BLUE TEMPERED SPRING STEEL
We believe that the way to sell is to carry a stock which permits satisfying any reasonable warehouse demand
87A Bridge Ave. Ext. Phone UN 4-2460
CAMBRIDGE 40, MASS.
Branch:
3042-3058 W. 51st Street, CHICAGO, ILL.
Phone: Grovehill 6-2600

another step in . . .

PRODUCTIVITY

the Motorized Rotating Crane Hook

by HEPPENSTALL

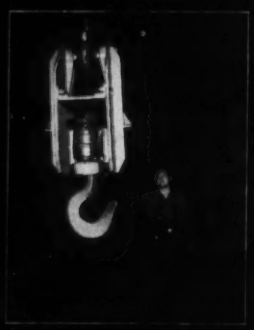


. . . Here is the latest development in the Heppenstall line of Tongs. It is the new motorized rotating crane hook designed by Heppenstall Engineers for use with existing crane blocks and hooks.

Features of this new Crane Hook are:

1. Turns all sorts of loads such as: coils, sheets, rolls.
2. Hook rotates a full 360 degrees in either direction.
3. All operations of the Heppenstall Motorized Rotating Crane Hook are controlled by the craneman from his cab.
4. A load cell can be incorporated with the hook recording weight of each load as it is lifted.
5. Capacities for largest industrial cranes.

Used with a "C" hook, the Heppenstall Motorized Rotating Crane Hook permits a coil of steel to be turned horizontally as it is lifted.



Electric motor furnishes power for turning the hook. Motor can be supplied to meet your current characteristics.

HEPPENSTALL

. . . tongs for every lifting problem.

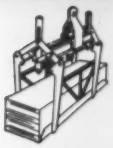
Write for complete information. Heppenstall Engineers will be pleased to help you adapt this new Heppenstall Motorized Rotating Crane Hook to your production requirements.

Send for this new catalog. It provides you with the solution to many lifting problems. Address: Heppenstall Company, Pittsburgh 1, Pa.

Tongs to lift Coil Horizontal around O.D.

Horizontal Coil Tong over ends

Tongs for lifting groups of rounds



Sheet lifter

JOHN J. FAJNOR
Brad Foote Gear v. p.

KENYON SWARTWOUT
Swartwout Co. president

B. J. DAVIS
Athol Machine v. p.

JOHN S. BILLINGSLEY
new post at Crucible

John J. Fajnor was elected a vice president, **Brad Foote Gear Works Inc.**, Chicago. He joined the company when it acquired American Gear & Mfg. Co. in 1950. He previously served American Gear as president and chief engineer. He has been plant manager of Brad Foote's Lemont, Ill., division, formerly American Gear.

Kenyon Swartwout, executive vice president, was elected president of **Swartwout Co.**, Cleveland, to succeed his father, **Denton K. Swartwout,** now chairman. **Charles Swartwout** succeeds his brother as executive vice president.

Kenneth R. Lundberg succeeds **H. Blake Thomas,** resigned, as general sales manager of **McQuay Inc.**, Minneapolis. Mr. Lundberg was general manager of the Grenada, Miss., plant.

Rodney R. Burns was named assistant to the manager, sheet sales division, **Pittsburgh Steel Co.**, Pittsburgh. He was a sales representative.

Joseph T. Ryerson & Son Inc. appointed **Hardie W. Beck** to fill the new post of sales manager for its Pittsburgh steel service plant. He was a sales representative.

Robert A. Gustison was named manager, minerals and chemical engineering group, metals research laboratories, **Electro Metallurgical Co.**, in Niagara Falls, N. Y. He succeeds **H. Rush Spedden,** recently named director of research for Union Carbide Ore Co.

B. J. Davis was elected vice president and general manager, **Athol Machine & Foundry Co.**, Athol, Mass. He was general manager-sales director.

Andrew B. Pulliam was made vice president and general manager of Borg - Warner Corp.'s **Marvel-Schebler Products Division,** Decatur, Ill. He succeeds **G. V. Patrick,** recently made managing director of Borg-Warner's new Australian affiliate, Coote & Jorgensen Ltd.

John C. Wallace was named vice president-engineering for **Walworth Co.**, New York. He was vice president-general manager, Hunt-Spiller Mfg. Corp.

W. C. Worley succeeds **Frank J. White,** retired, as Detroit district sales manager, **Weirton Steel Co.**, division of National Steel Corp.

Kenneth E. Sommerfeld was appointed assistant product manager, metal lath, for **Inland Steel Products Co.**, Milwaukee. He is succeeded as manager, marketing services division, by **Glenn R. Detrie.**

Samuel Storchheim was elected president and technical director, **Metals Research & Development Inc.**, Exeter, Pa. He was chief of nuclear manufacturing engineering and research at Glenn L. Martin Co.

Robert J. Brewer was made sales promotion manager, **Scott Aviation Corp.**, Lancaster, N. Y.

Crucible Steel Co. of America, Pittsburgh, appointed **John S. Billingsley** to the new post of assistant to the vice president-sales. He had been central area sales manager. Also filling new posts in the sales department are: **G. Whitney Snyder,** named assistant general sales manager-product divisions; **Robert M. Simpson,** named assistant general sales manager-field sales.

John T. McCarley was made general manager of **Yale & Towne Mfg. Co.'s** new west coast material handling division manufacturing plant, constructed at San Leandro, Calif. He was assistant general manager, Philadelphia plant.

Thomas P. Sleesman was made district sales manager, steel tube department, **Hofmann Industries Inc.**, Sinking Spring, Pa. He was in the sales department of Wheatland Tube Co.

Frank W. Foery was made general superintendent, steel division, **Yawman & Erbe Mfg. Co.**, Rochester, N. Y. **Raymond Moore** was made superintendent; **Charles Beeman,** assistant superinterdent.

F. Norman Tracy was elected president, **Ward LaFrance Truck Corp.**, Elmira, N. Y. He succeeds **Joseph G. Grossman,** retired.

Automatic Transportation Co., Chicago, division of Yale & Towne Mfg. Co., appointed **K. K. Stonebraker** sales manager, transporter line, to succeed **J. M. Johnson,** who

JOHN W. PRICE JR.

CLIFFORD B. BRUNDAGE JR.

U. S. Steel appointments

C. M. DONAHUE

E. W. MERRY

Mine Safety Appliances group v. p.s

fills the new post of national factory representative. **George H. Roggenkamp** was made chief electrical engineer to succeed **A. C. Elley**, retired.

John W. Price Jr. was appointed general superintendent, Edgar Thomson Works, Braddock, Pa., **U.S. Steel Corp.** He succeeds **W. E. Crouch Jr.**, recently made vice president - operations, Tennessee Coal & Iron Division. **Clifford B. Brundage Jr.**, division superintendent, maintenance at the Duquesne Works, succeeds Mr. Price as assistant general superintendent there.

Vascoloy-Ramet Corp. appointed **Herbert B. Clark** eastern district manager, with headquarters in Philadelphia.

Albert R. Kaspark was made manager of technical sales, **Wolverine Tube**, division of Calumet & Hecla Inc., Detroit.

Carl J. Oxford Jr. was appointed director of research, **National Twist Drill & Tool Co.**, Rochester, Mich. He was research engineer.

Allegheny Ludlum Steel Corp., Pittsburgh, research and development, appointed **John H. Crede** manager of development and technical services department; **Dr. Adolph J. Lena**, manager-basic research department; **Raymond L. Southern**, manager - laboratory services department.

Ferro Corp., Cleveland, made **Elmer W. Beck** general manager of refractories operations, a new post which co-ordinates management of its subsidiaries (Louthan Mfg. Co., East Liverpool, O., and American Clay Forming Co., Tyler, Tex.) and its ceramic supply division at Crooksville, O. Mr. Beck continues as general manager of the division and also assumes the presidencies of the two subsidiaries. **C. G. Gerster**, executive vice president of Louthan, now devotes full time as president of Patterson Foundry & Machine Co., East Liverpool, O., recently acquired. **Fred A. Layne** was made works manager at Louthan, in charge of sales and manufacturing. **Dwight Haley** was made works manager at American Clay; **W. H. Corban**, works manager, ceramic supply division.

Whitmell T. Rison, manager of the replacement division of **Thompson Products Inc.**, Cleveland, was elected a vice president.

J. W. Stack was made director of sales and contracts for the Milwaukee plants of **AC Spark Plug Division**, General Motors Corp. He succeeds **Howard W. Brandt**, resigned.

Forrest J. Hiday was made director of manufacturing, **American Kitchens Division**, Avco Mfg. Co., Connersville, Ind. He replaces **Paul O. Turner**, who resigned to accept a position as works manager, Addison Products Co., Jonesville, Mich.

Officers of the recently formed **Sylvania-Corning Nuclear Corp.**, Bayside, N. Y., are: **W. Benton Harrison**, chairman; **Dr. Lee L. Davenport**, president and treasurer; **Walter E. Kingston**, executive vice president; **Garth W. Edwards**, controller; **Howard M. Cohen**, secretary.

C. M. Donahue and **E. W. Merry** were elected group vice presidents of **Mine Safety Appliances Co.**, Pittsburgh. Mr. Donahue will head the mining products and international group; Mr. Merry, the industrial products group.

Ralph Boyer was appointed vice president and general manager. **Pipe Machinery Co.**, Alhambra, Calif.

William E. Connor joined **Dravo Corp.'s** machinery division, Pittsburgh, as sales engineer for its new material handling line. He was vice president-engineering of North Jersey Quarry Co.

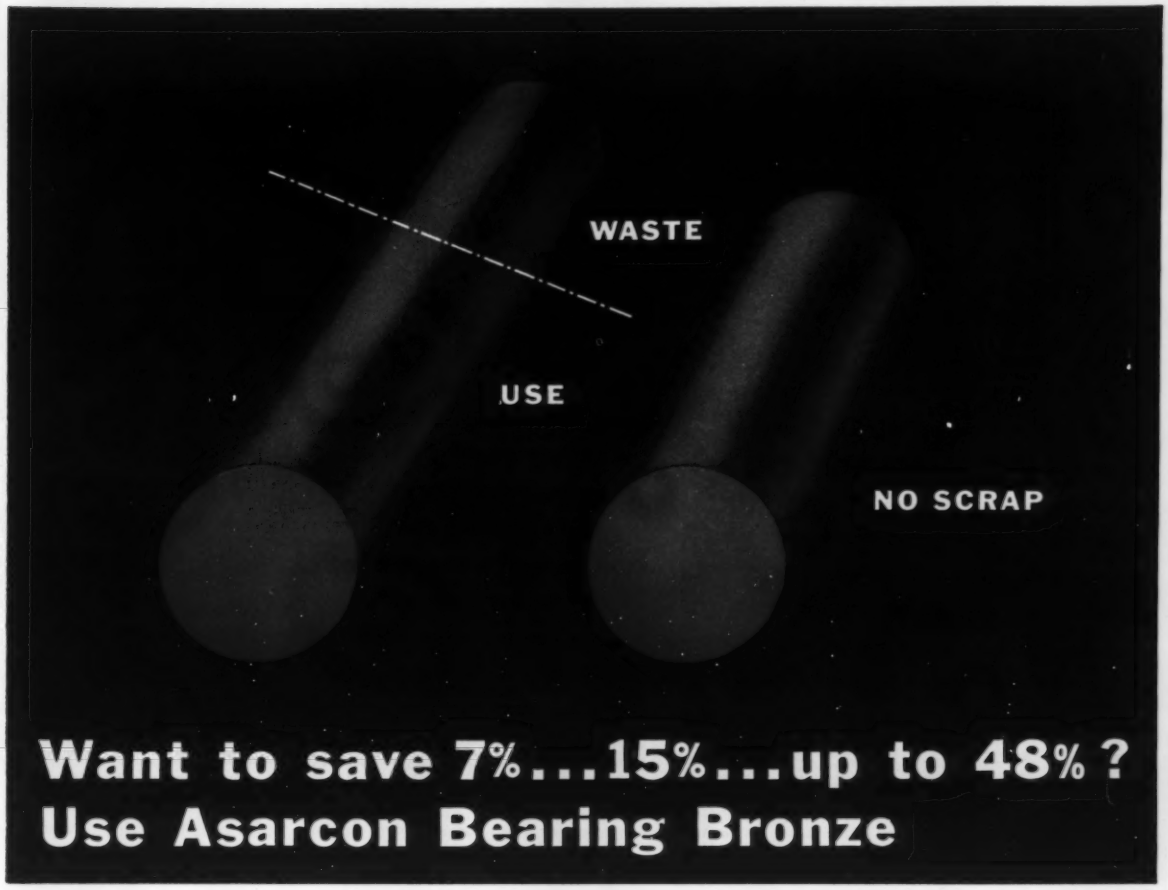
Harley-Davidson Motor Co., Milwaukee, elected **Walter C. Davidson** vice president-sales; **William J. Harley**, vice president-engineering; **O. P. Resech**, secretary-treasurer.

Robert C. Sabini, assistant to the president, Ekco Products Co., was named president of its new subsidiary, **Worley & Co.**, Pico, Calif.

Maurice J. Coughlin was named director of procurement for both the weapon systems and airplane divisions of **Bell Aircraft Corp.**, Buffalo.

Lefton Iron & Metal Co., St. Louis, appointed **Bernard Landau** manager of its brokerage division. He was manager of Atlas Trading Corp., in charge of purchases and sales of iron and steel scrap.

Ray Hurt was made purchasing agent, **Peters-Dalton Inc.**, Detroit, subsidiary of Detroit Harvester Co. He transfers from Detroit



Want to save 7%...15%...up to 48%? Use Asarcon Bearing Bronze

When you buy standard 13-inch bronze bars, you have a "remnant" problem.

A one-inch remnant on a 13-inch bar, is a 7.6 per cent loss; a two-inch remnant is a 15.3 per cent loss; and, if you bought a 13-inch bar when you needed only 6¾-inches, your loss could run as high as 48 per cent.

When you buy Asarcon 773 Continous-Cast bearing bronze, however, you can get the *exact* lengths you need, all the way up to 105-inches. You save on short-end scrap; moreover, you'll find that you're saving on diameter losses and machining time as well. For, with Asarcon 773 you order the *diameters* you want, up to 9-inches. The clean-up allowance for the size you specify is in the piece you get, and is less than the common ¼ inch on rough-cut bars; and Continous-Cast cored bars save you costly machining time plus the weight of the core metal.

Asarcon 773 (SAE 660) is stocked—in 260 sizes, solids and tubes – by a national network of conveniently located distributors. Talk to one of them, or write directly to us. We'll be glad to show you how other companies are turning short-end scrap losses into savings.

ASARCO

Continuous-Cast Products Department

AMERICAN SMELTING AND REFINING COMPANY

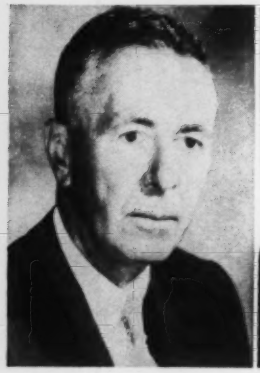
Perth Amboy Plant, Barber, New Jersey • Whiting, Indiana

WEST COAST SALES AGENT: Kingwell Bros. Ltd., 457 Minna Street, San Francisco IN CANADA: Federated Metals Canada, Ltd., Toronto and Montreal

WILLIAM J. FATH
Hydraulic Press works mgr.

HERBERT J. PETERSEN
Topp Mfg. president

SCOTT HARROD
Ditto exec. v. p.



JOHN C. VIRDEN
Eaton president-chairman

MALVERN J. MATHER
Allen Mfg. president

A. S. AULT
Chicago Vitreous gen. mgr.

Harvester's Dura Division in Toledo, O.

John C. Virden, president of **Eaton Mfg. Co.**, Cleveland, since Jan. 1, was elected chairman to succeed **Howard J. McGinn**, retired. Mr. Virden now occupies the dual posts of president-chairman. Mr. McGinn continues as a director and member of the executive committee.

W. J. Rutherford was made aviation sales manager, **General Logistics**, Pasadena, Calif., subsidiary of Aeroquip Corp. He was chief sales engineer for 11 western states.

Ralph B. Austrian was made sales manager, **Ling Electronics Inc.**, Los Angeles.

Frank G. Daveler was made manager, computer components division, **International Resistance Co.**, Philadelphia.

William O'Dell was made southeastern district manager of **H. M. Harper Co.** He has headquarters in Atlanta.

Malvern J. Mather was elected president, **Allen Mfg. Co.**, Hartford, Conn. He succeds **James G. Osmond**, retired. **Ellsworth S. Grant** was elected vice president-manufacturing.

A. S. Ault, vice president-sales, **Chicago Vitreous Corp.**, Cicero, Ill., division of Eagle-Picher Co., was promoted to general manager of the company.

Johns H. Congdon II was elected president of **Congdon & Carpenter Co.**, Providence, R. I. He replaces his father, **G. Maurice Congdon**, now chairman.

A. R. Kratzberg, former general superintendent, was named manager of **Fluor Products Co.'s** metal fabrication division at Paola, Kans. He succeeds **Clyde W. Hull**, resigned.

Richard D. Kelly, a vice president of **Electric Auto-Lite Co.**, Toledo, O., was named to the new post of director of equipment battery sales.

William J. Fath was made works manager, **Hydraulic Press Mfg. Co.**, division of Koehring Co. at Mt. Gilead, O. He is succeeded as production control manager by **Warren E. Beck. A. L. Wallace** succeeds Mr. Beck as assistant production control manager.

Herbert J. Petersen was elected president, **Topp Mfg. Co.**, division of Topp Industries Inc., formerly known as the Los Angeles manufacturing division. Mr. Petersen, founder of Topp Industries in 1951, is its executive vice president.

Scott Harrod fills the new post of executive vice president and general manager at **Ditto Inc.**, Chicago. He was vice president for finance, research and manufacturing. His new post covers marketing and Canadian operations.

John E. Montgomery, formerly chief tool engineer at Solar Aircraft Co.'s Des Moines, Iowa, plant, was named general manager, Sheaffer's Tool & Die Plant, Ft. Madison, Iowa, a division of **W. A. Sheaffer Pen Co.** He succeeds **A. A. Zuber** who was elected a vice president in charge of manufacturing and engineering for the company.

OBITUARIES...

Howard R. Youngkrantz, 43, chief engineer and metallurgist, **Apex Smelting Co.**, Chicago, died Mar. 27.

Wayne F. Strong, president, **Iron Fireman Mfg. Co.**, Cleveland, died Mar. 28.

Ernest Mortensen, retired president and general manager, **Wesson Tool Co.**, Ferndale, Mich., died Mar. 22.

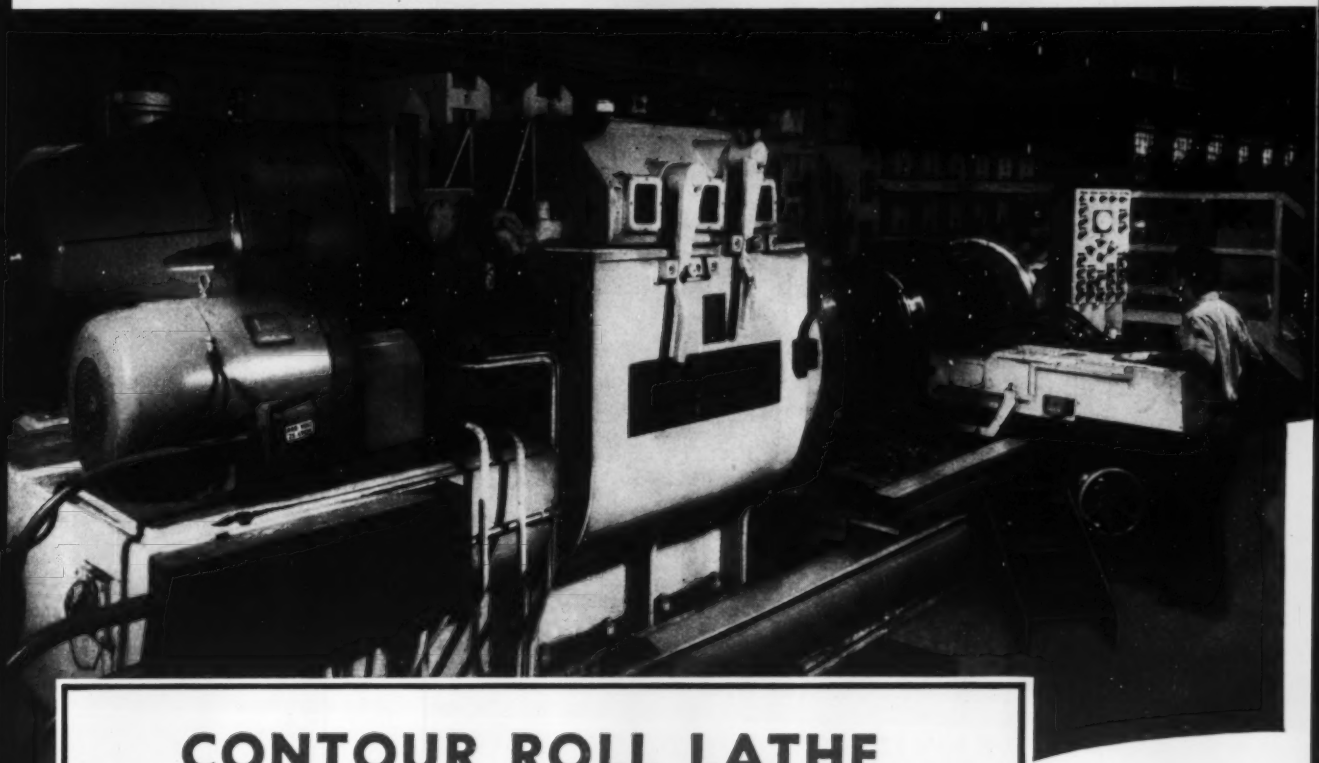
L. A. Shank, 57, treasurer, **Dayton Reliable Tool & Mfg. Co.**, Dayton, O., died Mar. 21.

Henry J. Lutz, 64, New York office manager, **Alan Wood Steel Co.**, died Mar. 22.

J. Harrison Sylvester, 43, plant superintendent, **O. Hommel Co.**, Carnegie, Pa., died Mar. 19.

Carl E. Jernberg, 67, founder and president, **Jernberg Forgings Co.**, Chicago, died Mar. 25.

Turn Rolls *Automatically* with "YOUNGSTOWN"



CONTOUR ROLL LATHE

with Hydraulic Tracer Control

Above Roll Lathe 36" maximum roll diameter.

Other capacities: 48" — 60"

f&m *features:*

- The rigidity of turning in neck housing and bearings eliminates tool chatter; allows heavier cuts and reduces tool cost.
- Complete hydraulic tracer control insures smoother, more accurate finish.
- Tool post and carriage designed to use either single point carbide-tipped tools or regular high speed tool steel roll turning tools.
- Ways on carriage and tail stock are non-metallic, which greatly extends service life.
- Timken roller bearings throughout herringbone gearing; automatic lubrication.

Designed to turn rolls better in any plant... from the smallest rod mill to the largest blooming mill

"YF&M" precision-built lathes turn rolls (either on necks or centers) with accuracy and fine finish. They have utmost rigidity and necessary speeds to cut hard alloy iron and mild steel rolls, with exceptionally low tool cost. These lathes are also available without tracer control, for cutting down back-up rolls and for cutting spalls from strip mill rolls. Tell us your needs.

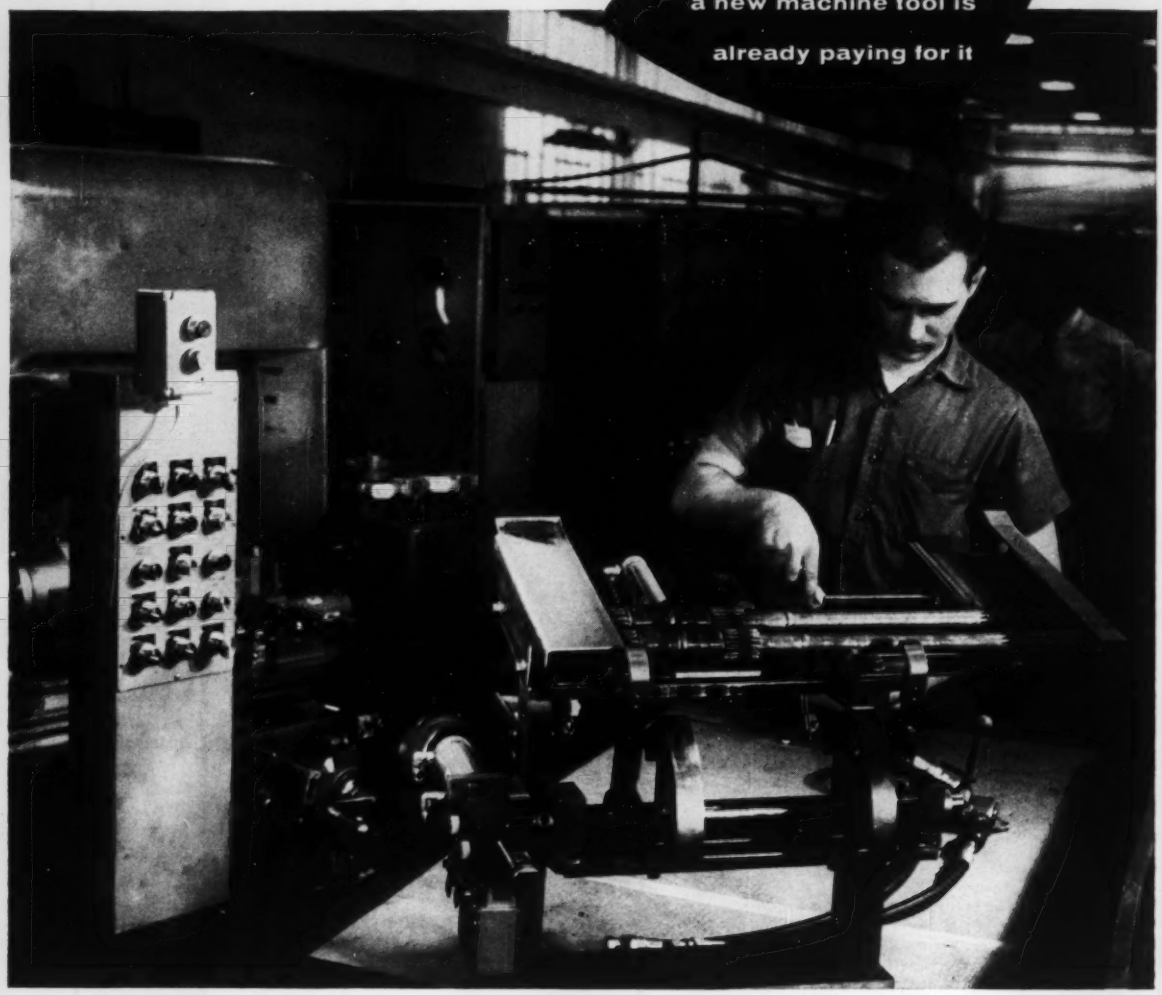
The Youngstown Foundry & Machine Co.

SERVING INDUSTRY SINCE 1885

Youngstown, Ohio

JONES & LAMSON FORM GRINDERS

the man who needs a new machine tool is already paying for it



Full Versatility to Suit Your Needs... Both Manual and Automatic

By using the automatic handling device shown above, a J & L Model E Form Grinder can handle 113 pieces per hour. Four grinding wheels plunge grind in one operation, to very close tolerances.

Other Model E's along this assembly line are equipped for crush wheel, or diamond trueing; automatic or manual handling; chucking work, center work or shoe-type support, depending on the work to be done.

This is an example of how plunge form grinding is being used in many plants to perform a great variety of work. Its superiority over other methods offers great benefits, in terms of versatility, accuracy and speed. Learn how J & L Form Grinders can help improve *your* production.

Write for Form Grinder Catalog, JONES & LAMSON MACHINE COMPANY, 517 Clinton Street, Springfield, Vermont.

Turret Lathes • Fay Automatic Lathes • Milling & Centering Machines • Optical Comparators • Thread Tools • Thread & Form Grinders

Link-Belt Expands

New Ewart manufacturing plant to employ 1000. Iron foundry nears completion

LINK-BELT CO. will build a $5-million plant at Indianapolis for the manufacture of power transmission and conveyor chains, sprockets and material handling equipment.

The new facility will replace an existing plant, increasing capacity by 50 per cent. Scheduled to be in full production by 1959, it will contain 400,000 sq ft and employ 1000. A new malleable iron foundry will be completed this year.

Link-Belt's sales, profits and backlogs for the first quarter are running ahead of last year's.

Kaiser Builds Ohio Foil Plant

Kaiser Aluminum & Chemical Corp. will build a $2-million aluminum foil processing plant at Belpre, O. Equipment to be installed will include three high-speed laminators and a multicolor rotogravure press. The 45,000 sq-ft facility will process foil from Kaiser's rolling mill at Ravenswood, W. Va.

Extends Line, Forms Subsidiary

Research - Cottrell Inc., Bound Brook, N. J., producer of industrial gas cleaning equipment, added the Aerodyne dust collector to its line. This unit was manufactured by Aerodyne Development Co., Cleveland. Formation of Research-Cottrell Ltd., Canadian subsidiary, was announced. Offices are at 33 Bloor St. East, Toronto 5, Ont.

Du Pont Builds $5-Million Lab

Work has begun on a $5-million laboratory at Chestnut Run, Del., for the Pigments and Electrochemicals departments of E. I. du Pont de Nemours & Co. The 81,000 sq-ft building will be for customer service and development work on titanium, silicon, pigments, sodium, peroxygen, chlorine, vinyl and related products. Facilities in the titanium metal laboratories will include furnaces for the preparation of the metal and its alloys, machine tools, hardness testers and metallographic laboratory equipment. The pigments area will house such new equipment as ball and roller mills which incorporate pigments into paint, plastics, rubber, paper and other products.

Detroit Warehouse for Finkl

A. Finkl & Sons Co., Chicago, manufacturers of die blocks, forgings and electric furnace steels, opened a new office and warehouse at 2122 Morrissey St., Detroit. E. H. Graham is manager.

Firm Licenses Process

Shaw Process Development Corp., Port Washington, N. Y., licensed three producers of plastic molds, die-casting dies and forging dies to produce cavities and cores by its precision investment casting process. They are: Di-Pierro Mfg. Co., Shrewsbury Mass.; Newark Die Corp., Newark, N. J.; and Standard Tool Co., Leominster, Mass.

Gates Installs Gas Turbine

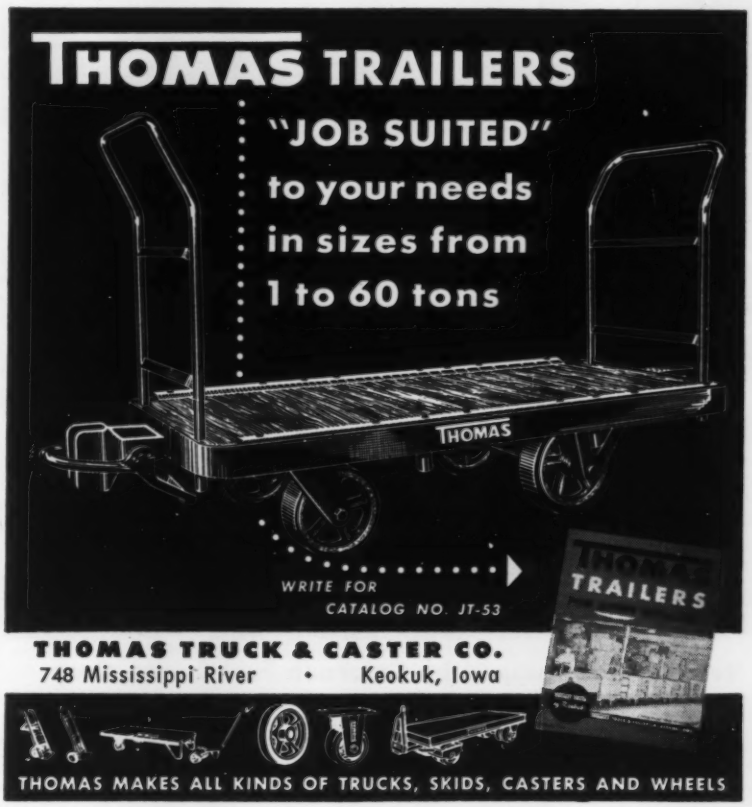
The rubber industry's first gas turbine has been installed at the Denver plant of Gates Rubber Co. Built by GE, the gas turbine-generator unit furnishes the plant with electricity and supplies heat to make process steam in a heat recovery boiler. Rated at 5000 kw, it will burn natural gas or distillate oil.

Building Research Center

National-U.S. Radiator Corp., Johnstown, Pa., has started construction of a million dollar Research Park Engineering Center. It will be the headquarters for development teams and research engineers working with heating and air conditioning systems.

New Plant for Nuclear Unit

The Nuclear Division of Stanat Mfg. Co. Inc., Westbury, N. Y., will soon occupy a new 20,000 sq-ft plant. Stanat makes nuclear



metal processing machinery for the atomic industry. S. L. Morrison directs engineering sales for the division. A. B. Palmer is design engineer.

Finn Doubles Facilities

Finn Aeronautical Division, Hawthorne, N. J., has doubled its facilities by acquiring an adjacent 10,000 sq-ft plant. The firm specializes in the fabrication of missile and jet engine prototypes.

Plant for New Company

American Steel Inc., Baltimore, is erecting a plant, containing 5000 sq ft, to manufacture steel joists. The company was organized recently by J. G. Yowell, president, and E. J. Rice, secretary-treasurer.

Republic Builds at Charlotte

Republic Steel Corp. will build a 25,000 sq-ft plant at Charlotte, N. C. It will manufacture riveted corrugated metal drainage products there.

GE Units Moved to Utica

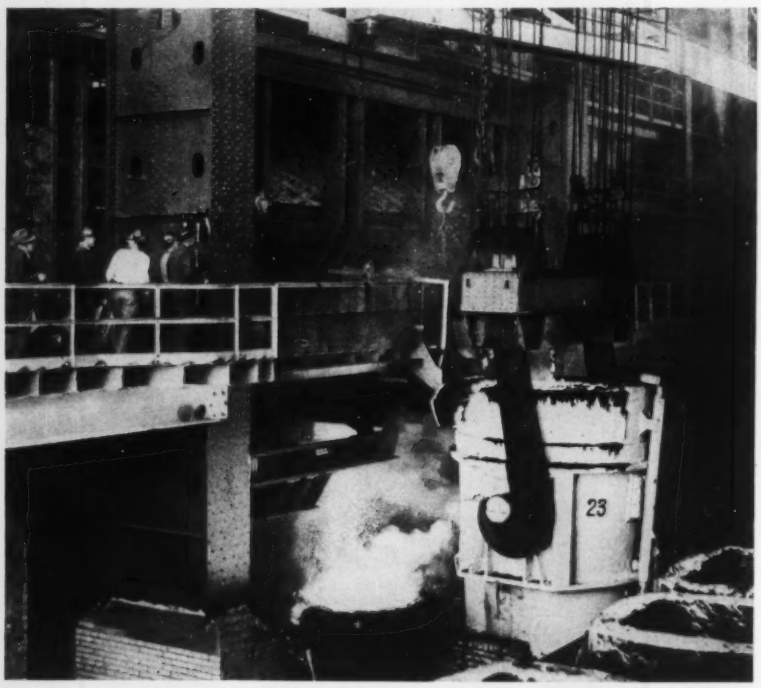
A segment of GE's Heavy Military Electronic Equipment Department, Syracuse, N. Y., will be operated in Utica, N. Y. It includes engineering, manufacturing and administrative functions. Three other departments are located in that city.

Container Maker Expands

Columbia Container Corp., Baltimore, is erecting an addition containing 12,500 sq ft of space which will bring the plant's area to about 95,000 sq ft. The firm makes corrugated containers, die-cut specialties, partitions and other products.

Opens Venezuela Subsidiary

Mine Safety Appliances Co. has established a wholly owned subsidiary in Venezuela. The new firm, Mine Safety Appliances de Venezuela C.A., will have warehouses at Caracas, Maracaibo and Puerto La Cruz. C. M. Donahue is president.



New Furnace Tapped by Colorado Fuel & Iron Corp.
This open hearth is the seventeenth to be placed in operation at Colorado Fuel & Iron Corp.'s Pueblo, Colo., steel plant. The largest in the group, it has a capacity of 230 tons per heat. All Pueblo furnaces have been converted to double ladle heat practice. Annual rated capacity has been increased from 1,485,000 to 1,800,000 tons

CONSOLIDATIONS

Avey Drilling Machine Co., Cincinnati, merged with **Motch & Merryweather Machinery Co.**, Cleveland. Operating as a separate unit of Motch & Merryweather, the Avey Division will retain its present facilities, management and personnel. Avey produces special transfer and indexing machines, as well as drilling, reaming and tapping equipment.

Rockwell Mfg. Co., Pittsburgh, purchased **Republic Flow Meters Co.**, Chicago. Republic manufactures electronic and pneumatic instruments and process control equipment.

Detroit Harvester Co., Detroit, purchased the Danville, Ill., plant of **F. L. Jacobs Co.**, maker of actuating power equipment for retractable automobile hardtops, doors, seats and windows.

Western Sealant Co., Western Sealant Development Corp., Production Welding Co., Borman Engineering Co. and Union Chemical Corp., all of Los Angeles, have merged to form **Consolidated American Industries Inc.** Located at 9999 W. Jefferson Blvd., Culver City, Calif., it will do aircraft subcontracting, machining, welding and casting impregnation.

Firestone Tire & Rubber Co., Akron, acquired **Electric Wheel Co.**, Quincy, Ill., producer of tractor and other farm equipment rims.

Ekco Products Co., Chicago, housewares manufacturer, purchased **Worley & Co.**, Pico, Calif., manufacturer of steel lockers, shelving racks and tables.

Emerson Electric Mfg. Co., St. Louis, purchased the assets of **Pryne & Co. Inc.**, Pomona, Calif. Emerson is a manufacturer of motors, fans, air conditioners and Sears tools. Pryne makes kitchen ventilator fans, recessed lights and heaters.

Wheelabrator mechanical descaler for cleaning skelp.

Another example of Steel Industry Savings with Wheelabrator® Mechanical Descaling

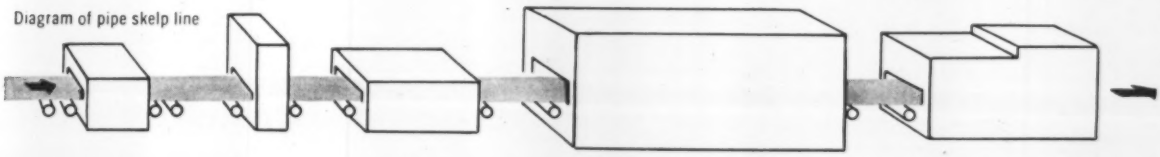
Wheelabrator mechanical descaling equipment, now being used to clean pipe skelp edges, serves to underline the versatility this process holds for the steel industry and shows the high degree of control that can be achieved.

In preparing pipe skelp for electrowelding, only a small strip along either edge of the bottom side of the skelp must be cleaned to bare virgin metal to the copper electrodes. Finish on the surface of the pipe, of course, is not critical.

In Wheelabrator equipment, a blasting wheel is positioned under each edge of the skelp so that the blast pattern is parallel with the length of the skelp. As skelp passes through the Wheelabrator there is fast, thorough cleaning of edges without wasting power or abrasive on areas that do not need to be cleaned.

For information on savings you can make with Wheelabrator equipment in all phases of steel descaling, write today for your copy of Bulletin 128-D.

Diagram of pipe skelp line



WHEELABRATOR® CORPORATION

509 South Byrkit Street Mishawaka, Indiana

NEW AAF AFTER-CLEANER Saves Dollars as it Solves Dust Problems

Cutaway view of new AAF Type P-17 Cycoil Oil Bath After-cleaner.

Type P-17 Cycoil

- **traps finest metalworking dust**
- **lowers cleaning costs**
- **saves money on fuel bills**

AAF's new P-17 Cycoil Oil Bath After-cleaner is specifically designed to bring you extra dividends from your metalworking dust control equipment. By collecting the *finest* dust, the P-17 permits *recirculation* of cleaned air. This saves fuel dollars, prevents oxidation to building and eliminates the necessity of "dumping" exhausted interior air to the outside.

In *new* installations of dust control equipment, there's an *added* advantage. The Cycoil eliminates costly duct work through the building structure. Complete dust collection units may be moved at any time to conform with revision in plant layout.

The new P-17 Cycoil offers maximum cleaning efficiency, requires minimum floor space. Sludge may be collected in a remote settling tank for infrequent servicing during regular working hours. Make sure you get *all* the advantages of modern dust collection methods. Call your local AAF representative, or write direct for Cycoil information.

AAF Herman Nelson

American Air Filter
COMPANY, INC.
443 Central Avenue, Louisville 8, Kentucky
American Air Filter of Canada, Ltd., Montreal, P. Q.

Air Filters and Precipitators

Illinois Heating Specialties

BETTER AIR IS OUR BUSINESS

Herman Nelson Unit Heaters

Herman Nelson Portable Heaters

STEEL
April 8, 1957

Technical Outlook

SCARFING— Nearly 20 per cent of all steel produced in the U.S. this year will be machine scarfed—a 3 per cent jump in one year. The 46 hot scarfing machines in operation will soon be augmented by 11 more, including nine for wide slabs, says Linde Air Products Co.

FAST STACK— When the exhaust stack over its pickling tank needed fast replacement, Atlantic Steel Co., Atlanta, tried an expedient. Sheets of corrugated plastic roofing (frequently used to cover patios) were fastened together with Monel bolts to form a 5 x 30 ft stack. After seven months, the glass reinforced material shows no corrosion. The stack appears to be just as effective as its costlier original.

TOOLS GROUND ELECTRICALLY— A new line of solid carbide end mills is being turned out with electrolytic grinding at the Abrasives Division, Elgin National Watch Co., Elgin, Ill. Circumventing the heat-stress problem, the grinding method puts a negative electrical charge on the diamond wheel and a positive charge on the tool blank. Metal is removed by combined electrochemical action and diamond abrasion. Elgin will market the tools in 1/16 to ½-in. diameters.

PORCELAIN TESTS— After evaluating results of a 15-year weather exposure test of porcelain enameled steels, the National Bureau of Standards gives this advice. In architectural uses where appearance, no fading and ease of cleaning are important: 1. Only enamels having class A or class AA acid resistance by the standard citric acid spot test should be used. 2. For enamels containing the cadmium-selenium-sulphur pigment (red, orange and yellow), compositions used should give a weight loss of less than 1.0 mg per cu cm when boiled in 10 per cent nitric acid for 2½-hours.

REMOVES CHROMIUM— MacDermid Inc., Waterbury, Conn., reports it has a new process for taking chromium out of copper plating baths. Two prepared materials are added; then the bath is carbon treated and filtered. There are no side effects. Plate roughness, stains, blistering, "skip-plate" and erratic anode behavior may result from chromium contamination.

STUDY WEAR— Engineers at General Motors' Technical Center are using radioactive isotopes to study production tool and auto engine wear. Tool wear studies are made with short half-life, 24-hour tungsten-187, a strong gamma emitter. The amount of tool material in the chips can be measured. Radioactivated lubricants let the engineers measure piston ring wear in engines as a function of time.

NO HANDS— Automatic pouring units on all three ladle cranes in the melt shop at Timken Roller Bearing Co.'s Steel & Tube Division, Canton, O., make for a safer, easier operation. A hydraulic cylinder mounted on the stopper rigging and a power unit mounted on the crane permit the pourer to control the flow of hot metal by pushbutton. The method requires less physical exertion than lever pouring and gives the operator more positive control. Mold life has also been improved, says Timken.

Metalworking Outlook—p. 53 *Market Outlook—p. 139*

Metal Congress in the West

Mr. Crites's talk (see below) on brazed honeycombs was a part of the technical program at the Western Metal Congress & Exposition in Los Angeles week before last. Sessions sponsored by American Society for Metals and American Welding Society featured many papers on aircraft metals and their fabrication. The Industrial Heating Equipment Association, Society for Nondestructive Testing and several other organizations participated.

A special titanium conference presented by ASM's recently formed Metals Engineering Institute was aimed at solving shop level problems in production.

Here are some comments gleaned by STEEL at the technical sessions:

COLD EXTRUSION: "The strongest aluminum alloys, such as 7075 and 2014, are being cold extruded in lengths up to 60 ft and diameters up to 8 in. Both internal and external discontinuous configurations are being made as an integral part of tubular structures."
Raymond A. Quadt, vice president, Hunter Douglas Aluminum Corp., Riverside, Calif.

CORROSION: "Control begins with careful periodic inspection that will reveal effects of corrosion in its earliest stages."
Edward H. Tandy, chief inspector, Standard Oil Co. of California, El Segundo, Calif.

INSPECTION: "Multiple film technique is being used to speed industrial radiographic inspection."
Ralph E. Turner, Eastman Kodak Co., Rochester, N. Y.

MOLYBDENUM ALLOY: "A molybdenum alloy with 0.5 per cent titanium has a higher useful strength over 1600°F than any other known material . . . Coatings have been developed for protection up to 2000°F for several hundred

Brazing Stainless Steel Honeycombs

The process of joining this material has been approached from nearly every angle. Most widely used: Retort brazing. Most promising: Vacuum process

By G. JEWETT CRITES
Consultant
El Segundo, Calif.

ONE of the most promising materials for supersonic aircraft and missiles is welded stainless steel honeycomb core with brazed face sheets and closeouts.

It most closely meets the requirements for a material that has a high strength to weight ratio and can stand the high temperatures generated by atmospheric skin friction.

Core — The honeycomb core is stainless steel foil 0.001 to 0.003 in. thick. The core is formed by resistance welding adjacent nodes of the formed foil. Cells may be hexagonal, square or other shapes 3/16 to ¾-in. wide. Core depths can run to 9 in. or more.

Many components of newly designed aircraft and missiles include adhesive bonded honeycomb of aluminum or stainless. There are small areas of brazed stainless honeycomb on such ships as the B-58. The contemplated all-stainless steel airplane, however, is still on the drawing boards.

Materials — Honeycomb materials under consideration include titanium, 17-7 PH steels and AM-350. Other materials, including mild steel, many tool steels, 18-8 stainless and hardenable chrome stainless, have been tested and found unfit.

The temperature range with which we are dealing is 600 to 800°F. This temperature is encountered at speeds of Mach 2 to 4. They will soon be reached in powered flight and will be surpased by ballistic missiles re-entering the earth's atmosphere.

Although work is being done on high temperature adhesive bonded and resistance welded honeycomb sandwiches, brazing seems to be the most promising fabrication method.

Brazing Alloys—The brazing alloys being studied melt at 1600 to 2000°F. A rule of thumb requires that the melting point be about

hours . . . missiles on the drafting boards will use a lot more molybdenum alloys."
Robert R. Freeman, manager, arc cast molybdenum development, Climax Molybdenum Co., New York.

PUMPS: "Centrifugal pumps of welded design are being built for temperatures of minus 300°F to plus 1500°F and for pressures of a few pounds to 2500 psi."
F. R. Drahos, senior metallurgist, Byron Jackson Division, Borg-Warner Corp., Los Angeles.

INDUCTION HEATING: "The only chance for a return to lower prices is the adoption of processes and techniques which will reduce manhour and material costs per unit . . . induction brazing and soldering are such processes."
W. E. Benninghoff, manager, Tocco Division, Ohio Crankshaft Co., Cleveland.

WELD CRACKING: "Phosphorus, although within specification limits of aircraft quality steels, is responsible for low ductility and subsequent cracking of welds at temperatures just below the solidus or melting point."
Glen E. Faulkner, Battelle Memorial Institute, Columbus, O.

TITANIUM EXTRUSIONS: "Demand for titanium extrusions will intensify in 1957 . . . interest is spurred by improvement in metal quality, substantial price reductions and the development of extrusion techniques."
Eric A. Berg, assistant technical director, Harvey Machine Co., Torrance, Calif.

THERMAL METALS: "Aircraft speeds of three times the speed of sound appear feasible in the near future. This means stabilized skin temperatures of about 500°F. Speeds of four times that of sound will increase this to 900°F. In appraising structural materials for this use, the most important properties are ultimate tensile, tensile yield, compressive yield and shear strengths, and modulus of elasticity."
Wayne A. Reinsch, senior research engineer, North American Aviation Inc., Hawthorne, Calif.

WELDING: "Resistance welding controls are being manufactured which use digital counting systems based on the Dekatron—a cold cathode counting tube developed in England. It makes possible the timing of precise intervals, whether a fraction of a second or many seconds."
J. J. Riley, chief electrical engineer, Taylor Winfield Corp., Warren, O.

twice the operating temperature.

High on the list comes silver-manganese, either as a binary alloy or containing small amounts of lithium, nickel, chromium, iron, cobalt or copper.

The brazing alloy must have good wettability and corrosion resistance, and must not decrease the strength of the parent metal by intergranular penetration. One alloy is not enough; fabrication techniques require a complete family of alloys so multiple stage brazing can be done.

Methods—The process of brazing honeycomb structures has been approached from almost every conceivable angle. While honeycomb sandwich materials have excellent strength and oxidation resistance at 600 to 800°F, all are reactive at high temperatures and must be protected during brazing. Some of the methods under study include:

1. Retort brazing—The part and its tooling are placed in a protective retort which is put into a conventional high temperature furnace.

2. Hot wall vacuum brazing—The part and its tooling are placed in a high vacuum retort which is enclosed in an electric furnace. The part is cooled either by removing the furnace from around the retort or by moving the part, still under vacuum, from the hot section of the retort to a cool section.

3. Cold wall vacuum brazing—The heating elements and their insulation are contained in a water-cooled vacuum chamber. The part and its tooling are placed in this chamber for brazing. Parts are cooled by circulating an inert gas which conducts the heat to the water-cooled walls.

4. Induction brazing—A high frequency induction coil is used to heat the part to brazing temperature. The part must be protected from atmospheric contamination during brazing.

5. Electric blanket brazing—The part, protected by an inert gas contained in a thin metal retort, is placed between ceramic plates in which electric heating elements are recessed. Heating of the honeycomb panel is by conduction.

6. Blow torch brazing—The part, again contained in a protective foil retort, is subjected to the direct products of combustion of an oil or gas-fired furnace.

7. Radiant lamp brazing—The part is brought to brazing temperature by high energy quartz lamps backed by reflectors. A protective atmosphere must be provided.

8. Salt bath brazing—This method is least successful because of size restrictions and because the cellular structure of honeycomb core does not lend itself to easy cleanup.

Preferred—Most of those methods have had some degree of success. The most publicized stainless steel honeycomb parts, those used on the B-58, are produced mainly by the retort method.

One reason for the widespread use of retort brazing is that furnace equipment can best be adapted to it. All other methods require more extensive expenditures for new equipment. This is particularly true for vacuum brazing; but the many advantages of this

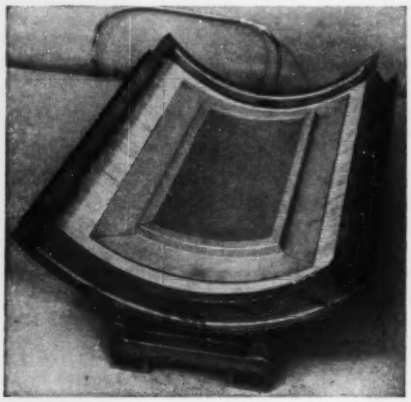
BRAZING HONEYCOMBS . . . method are rapidly causing its adoption.

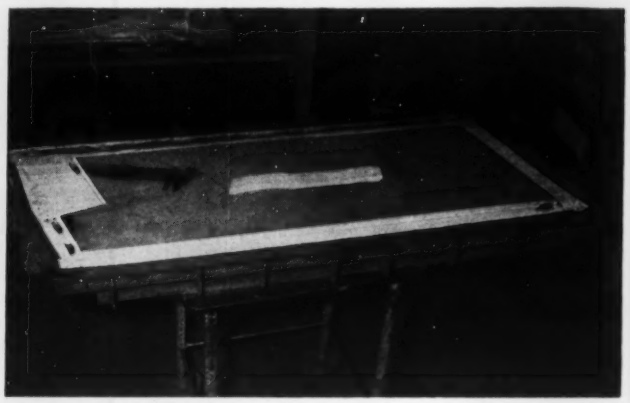
There are three: 1. Vacuum is an excellent protective atmosphere. 2. Brazes made in vacuum generally are stronger than those made in inert or hydrogen atmospheres. 3. The vacuum furnace obviates the use of the complicated retort and the cost of inert gases.

Fit Up—The brazing operation is practically as complicated as the equipment in which it is done. The fit up of the material to be brazed must be almost perfect to assure a good product. Gaps of 0.003 to 0.005 in. between contoured honeycomb core and stretch formed or taper machined skins are the maximum allowable.

Brazes on the closeouts or edge members must be perfect because these members transfer the stresses of the completed airplane or missile.

Tooling — Another problem is





Examples of contoured and flat honeycomb panels with their furnace tooling

Honeycombs for B-58 Are Brazed

The assembly and joining of stainless honeycomb panels is an exacting procedure. Here is how technicians do it at Convair's Ft. Worth, Tex., plant

MANY of the critical surfaces of the delta wing B-58 supersonic jet are brazed stainless steel honeycomb panel assemblies.

They include trailing edges, wing skins and engine nacelle panels. Sizes and shapes vary—from a 48 x 66 in. wedge-shaped trailing edge to a 7 x 15 in. skin panel with complex contours.

Assembly—Preparation of honeycomb panel assemblies at the Ft. Worth, Tex., plant of Convair, a division of General Dynamics Corp., begins in a sealed room where air purity, temperature and humidity are controlled.

White-gloved technicians build up the "sandwiches" to be brazed. On the bottom goes a stainless steel sheet to separate the skin surface from the graphite reference form. Next come the stainless steel skin, a sheet of silver-manganese (85-15) brazing alloy and the stainless honeycomb core.

Another layer of brazing alloy and another stainless skin are applied. Then the assembly is positioned on the graphite reference block which is machined in the shape of contoured sections or perfectly flat for wedge sections.

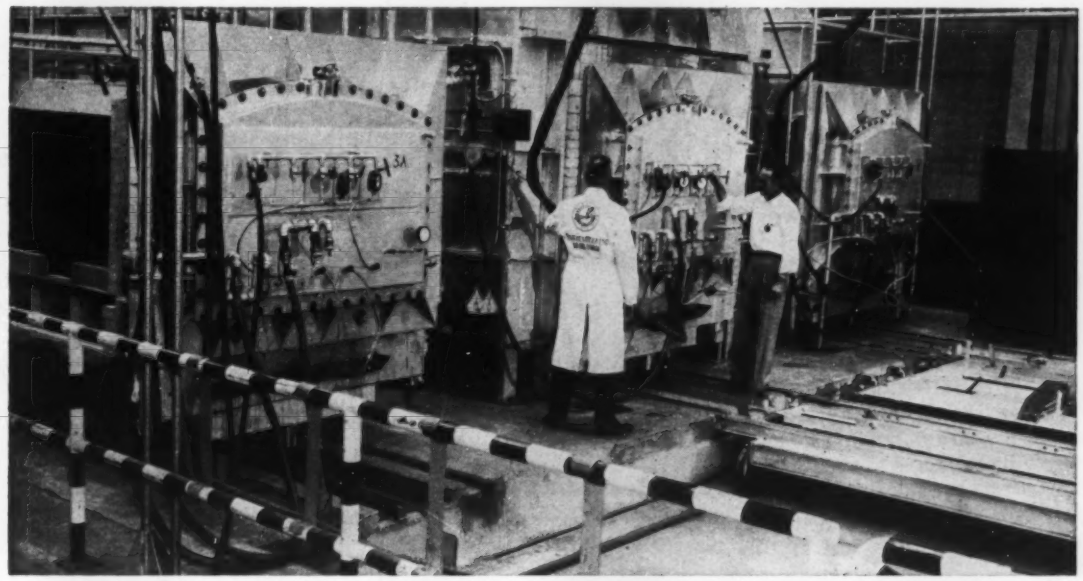
Enclosed—This stack is tack brazed, then placed in a stainless steel box. A stainless steel diaphragm is Heliarc welded on top and a vacuum of about 8 in. of mercury is pulled on the box. The dimensions of the box are such that the welded cover diaphragm exerts a uniform pressure on the top layer of stainless steel skin.

The box is put into a retort in which it remains for the entire brazing operation. The retort is purged with argon gas at static pressure until the specific gravity of the argon is 1.37. This takes about an hour. From here, the retort goes to the brazing furnace.

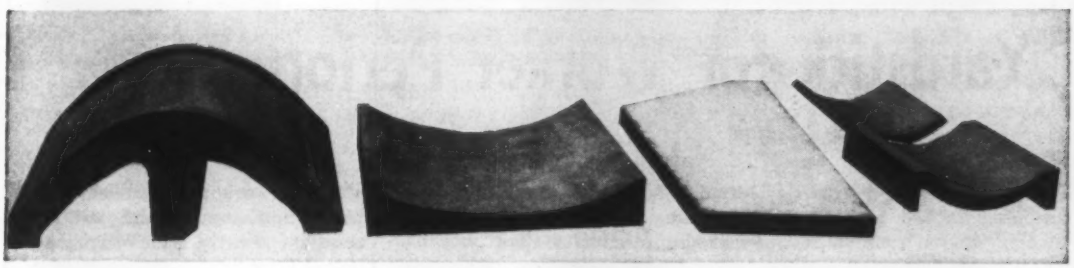
one of tooling. It is necessary to accurately support the delicate core and thin skins, in intimate contact, at temperatures of 1600 to 2000°F. Refractory materials such as graphite, ceramics and silicon carbide are being used, but the difference in thermal expansion between the tooling and the part makes further compromise necessary.

At present, the most common tooling technique is the use of a partially evacuated metal foil bag surrounding the part. The tooling can be either inside or outside the bag. High vacuum brazing also is tooled similarly by using a high vacuum within the bag and a partial pressure on the exterior. The thermal expansion problem is minimized by restricting the dimensions of the part.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*



Brazing setup includes (left to right) the purging station, brazing furnace and cooling chamber



Some of the contoured and flat graphite reference forms used for brazing honeycomb panels

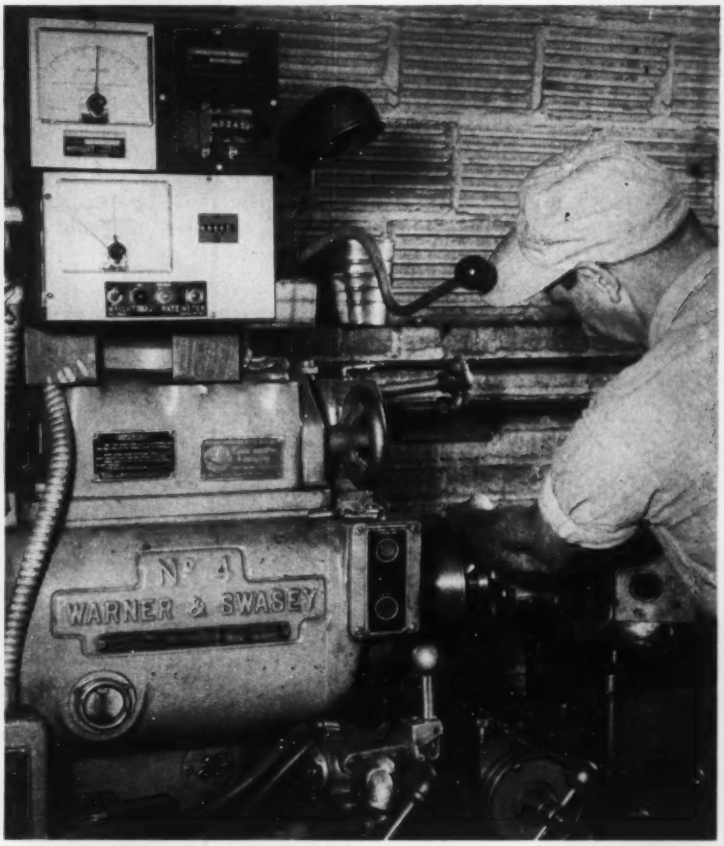
Heating—The furnace temperature is raised to 1815°F and held for about 15 minutes, then dropped to 1400°F and held to 90 minutes for solution heat treating or transformation.

In the next step, the retort goes to a cooling chamber where the temperature is dropped to 400°F or lower. The box is opened and the completed panel sent along for inspection, further processing and assembly.

Graphite Forms—These honeycomb panels are fabricated on what are said to be perhaps the largest graphite reference forms ever used in furnace brazing. Blocks as large as 62 x 46½ x 20 in. are supplied by National Carbon Co., a division of Union Carbide & Carbon Corp.

Graphite forms have good heat transfer properties, thermal and dimensional stability and are readily machinable. Convair gets the graphite in slab form and machines it within plus or minus 0.003 in. of required contours.

"How am I doing?" the machine operator wants to know. This device gives him and his foreman an up-to-the-minute answer in terms of production rate



The meter mounts directly on a machine where it can be seen easily by the operator and his foreman

Yardstick for Worker Performance

SCHEMES for measuring a worker's performance lacked a necessary dimension in the opinion of Richard B. Wright, vice president of Wright Tool & Forge Co., Barberton, O. The man on piecework, and his superior, could keep track of hourly output, but neither had an objective way of measuring minute-by-minute performance. Recording charts and stop watches didn't seem to hold the answer.

This rankled Mr. Wright's business sense (Wharton, '54) and challenged his engineering background (Cal Tech, '53). The eventual result was a little black box.

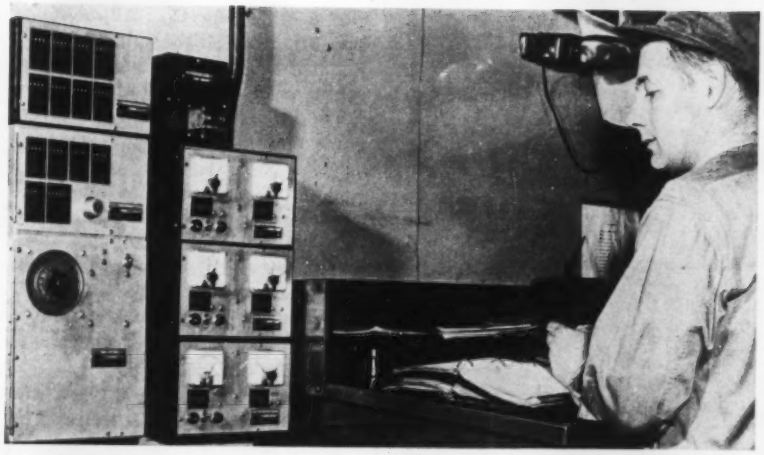
Computer—He calls it a production rate meter. Its obvious external components are a dial and a totaling counter; inside is an averaging circuit.

The circuit considers production on a machine over a 15-minute period to give a balanced picture of the production rate. As time passes, the circuit constantly drops information over 15 minutes old and averages in new information. The result is continuously reported on the dial in terms of pieces per hour.

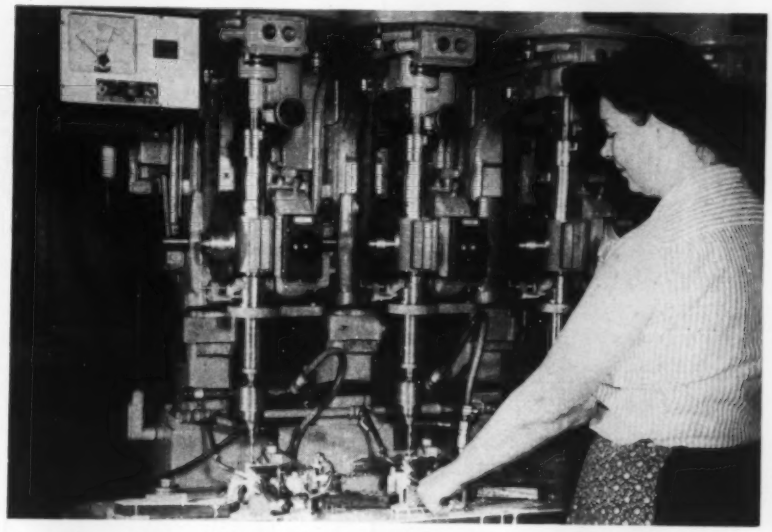
A work stoppage shows up as a declining production rate which reaches zero when the machine has been down for 15 minutes. Behind the choice of the short base period and the manner in which the meter affects a worker is a philosophy of production control and industrial relations which Mr. Wright puts this way:

Averages—"Unless a machine is fully automatic, the time required to produce individual pieces varies substantially. These variations are unimportant except that their sum determines the time for a lot of work. It is the average production rate that production personnel should concern themselves with. The average should be computed over a short time or it will be slow in responding to changes in the production rate and may even conceal significant changes.

"The operator is the man who



Sometimes it's convenient to run the output of a number of meters to a central location such as a foreman's desk



A single meter can keep track of the production rate on a battery of machines, such as this multiple drill unit

really determines the output of a machine. The more guidance and information he is given, the better job he can do. The rate meter gives him information about his production that he can understand, challenges him to do better and immediately shows the results of any improvement."

All Things — According to Mr. Wright, the meter performs these functions: 1. Presents production information in a form that even the uneducated worker can understand. 2. Gives the information directly to the worker and his foreman. 3. Presents the information while there is still time to investigate a situation and take corrective action. 4. Creates incentive and improves worker performance without animosity or compulsion. 5. Acts as a valuable training tool.

The net result is to get more production from the same number of machines and workers by reducing wasted time.

Installation—This is a lot to expect of any instrument. Over two years of use, Wright Tool & Forge has built a considerable body of experience to support its use. It has been installed on punch presses, lathes, drill presses and forging machines.

The company has found that the meter belongs on a machine where the operator can read the dial without leaving his working position. The dial should also be visible to the supervisor, either on the machine or in a bank of repeater dials at some central location such as a foreman's desk. Foremen can detect trouble spots immediately.

The meter is purposely small (about 9 x 9 x 6 in.) and simple in appearance to avoid making the worker feel that a major change is being made on his machine. It operates from a conventional solenoid hookup such as might be used to actuate a counter.

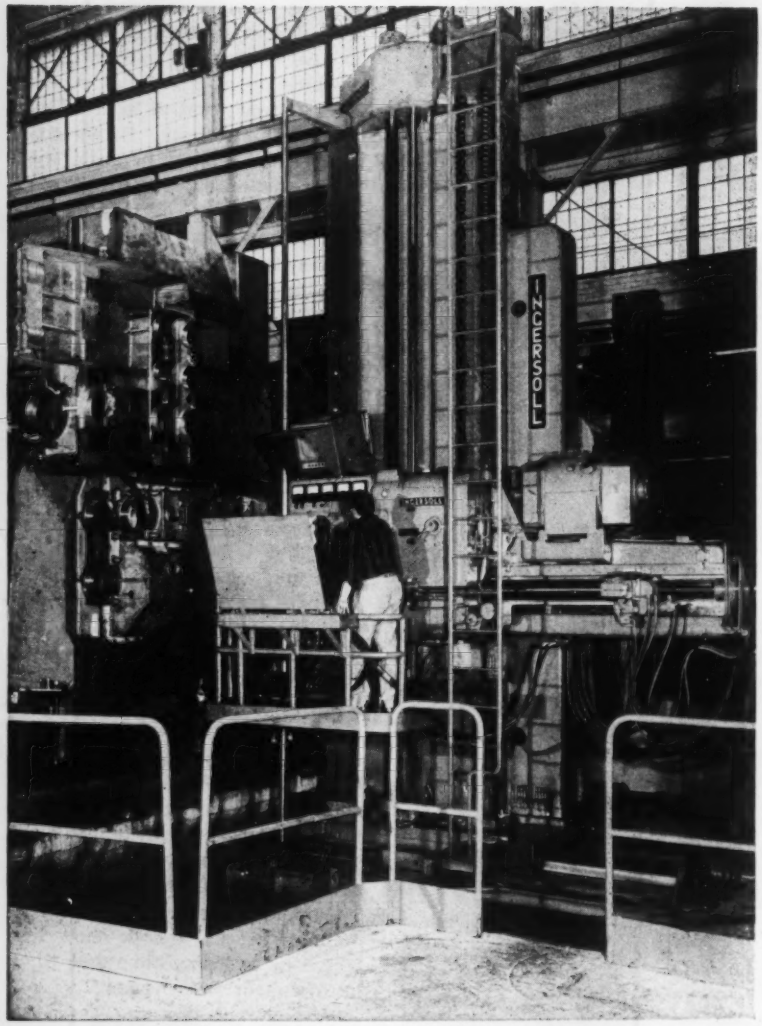
Fair Play—The meter makes no permanent record. Mr. Wright feels that a permanent one discourages an operator from trying to improve. He may fear that if he reaches a peak by unusual exertion, it will be cited by management and expected of him permanently. To overcome this attitude, management must establish fair piecework rates and stick by them even though the operator substantially improves his skill.

Of course, the meter can be tied in with an incentive system. The experience at Wright has been that an operator working with a meter tends to become highly skilled more quickly than one without one—his average earnings are higher, too. The meter doesn't compel him to do more work; it does show him where he is losing time and when he has made improvement.

Training — An added benefit comes when the meter is put on a trainee's machine. It seems to help him develop skills more quickly and to reveal how he can adapt standard motion patterns to his own capabilities. It also helps foremen and operators get the most out of a new machine, and aids them in developing manufacturing procedures for new parts.

So far the production rate meter has been strictly a home grown development. Now the company is thinking in terms of a market for it and is placing trial models in other plants.

To the obvious question ("What does the union think about it?") the company has a ready answer. The local shop president thinks it's great. He has one on his machine and wouldn't be without it. It gets him help in a hurry when his machine is having difficulties, and it helps him make more money.



Traveling-housing milling and boring machine works on a huge gear case

TV Aids a Milling Machine

It lets the operator read remote scales without climbing over the machine. It has helped a crane builder reduce both job setup and operating cycle times

SOME SETUP and machining times have been reduced as much as 80 per cent on this huge milling and boring machine. One of the responsible factors is closed-circuit television.

A perennial problem of operators is the reading of remote scales and dials. Climbing over the machine to get at them can be a time-consuming job.

TV Request—Engineers at Morgan Engineering Co., Alliance, O., and Ingersoll Milling Machine Co., Rockford, Ill., took that into account when they got together to draw up specifications for Morgan's new machine.

Two points seemed particularly remote—the scales that show the transverse and longitudinal positions of the machine housing. The problem was solved with a closed-circuit television setup. Two TV cameras are permanently mounted to read the longitudinal and transverse travel.

The operator, standing on the machine platform, can select the scale he wants to read and can follow it continuously. He also can see the screen (mounted just above the platform) from the floor.

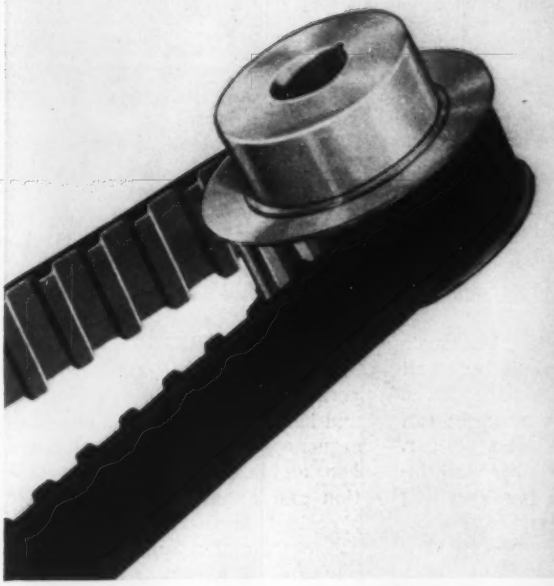
Tolerances—The machine is used to mill and bore huge castings, weldments and forgings. On the trolley frame in the photo at left, it cuts to a 0.002-in. tolerance on all bores. The tolerance is 0.005 in. on the center distances between bores.

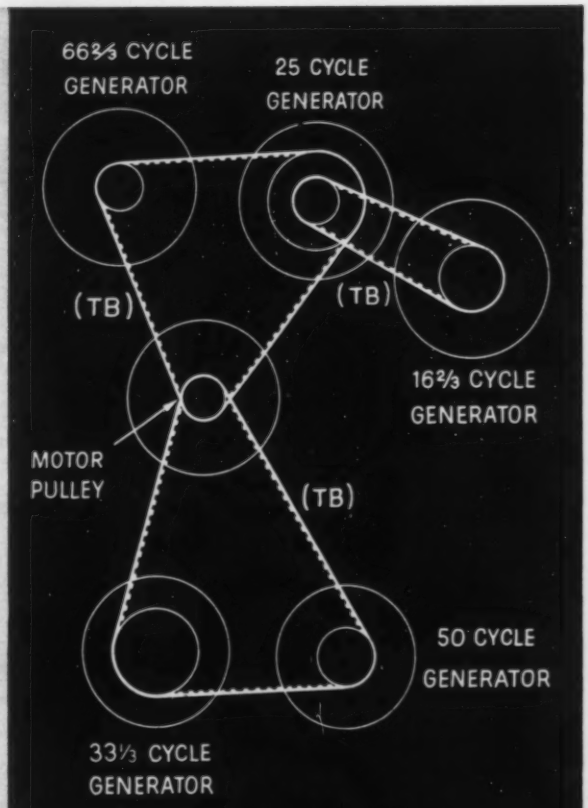
The machine has a 7-in. bar spindle powered by a 50-hp motor. Speeds range from 2 to 486 rpm, feeds from 0.047 in. to 28 fpm. It has a 15-ft vertical travel on the head, and a 24-ft longitudinal travel on the housing. Transverse travel is 6 ft. The work area is 15 x 24 ft.

The machine operator checks the position of his machine housing by selecting a channel on his closed-circuit TV

PowerGrip "TIMING" BELTS

Making one motor do the job of five





Above is a schematic drawing of a 5-frequency telephone ringing unit on a party-line system. Previously, five motors were needed to generate the different ringing frequencies. But with the installation of just *three* U.S. PowerGrip "Timing" Belts (TB) *only one motor is needed* now. That's because U.S. PowerGrip provides a positive, non-slip grip that preserves the exact speed ratios and the synchronization needed to maintain critical frequencies. And there is absolutely no measurable power loss.

This is one more example of the U.S. PowerGrip "Timing"® Belt's ability to simplify and improve a power transmission unit . . . one of the reasons why the invention of U.S. PowerGrip "Timing" Belt was recently awarded the Franklin Institute's Edward Longstreth Medal for "Invention of High Order."

Whether it's for the design of hand tools, lathes, drill presses, saws, electric typewriters—from fleapower to horsepower—U.S. PowerGrip offers all these advantages:

- *no slippage, no take-up—allows short centers, high ratios.*
- *absence of metal-to-metal contact—eliminates need for lubrication and housing devices.*
- *handles speeds up to 16,000 F.P.M. or so slow as to be imperceptible to the eye.*
- *close to 100% efficiency.*
- *imbedded with steel cables for high tensile strength*
- *constant angular velocity.*

These belts—plus expert engineering service—are obtainable at "U.S." power transmission distributors, at any of the 28 "U.S." District Offices, or by writing us at Rockefeller Center, New York 20, N. Y.

Mechanical Goods Division

United States Rubber

Cutler-Hammer Inc. and Arthur G. McKee & Co. have built a control to make charging faster and more automatic. It goes to U. S. Steel's Fairless Works

An outstanding feature of the control system is the ease with which instructions can be put in and information read out. The engineer is pointing out the program indication panel. The program selector panel lies to the left, and the fault annunciator panel behind the man on the right

Closer Control for the Blast Furnace

THE LATEST word in blast furnace charging controls adds three substantial refinements to an already elaborate system:

1. Situation-at-a-glance information display.
2. Program selection simple as flipping a switch.
3. Quick and definite trouble isolation.

A system with these features will soon be shipped from the Cutler-Hammer Inc. plant in Milwaukee to U.S. Steel's Fairless Works, Fairless Hills, Pa. It will be installed on the No. 3 furnace, now under construction.

A joint development of Arthur G. McKee & Co., Cleveland, and Cutler-Hammer, the control consolidates all furnace charging functions into one integrated system. Information display is duplicated in the stock house and hoist house so that personnel in both know immediately what is going on.

Stock House — Control equipment in the stock house is arranged on two panels. The scale car operator's panel is a small console located at the edge of the stock house platform where he can reach it easily from the scale car. It includes only switches and indicators he needs for handling coke, ore, stone, water and scrap.

Behind the console, and in view of the scale car operator, is a much larger indicating, manual operation and automatic transfer panel. It is sectionalized to separate indicating and operating functions (as are other panels in the system).

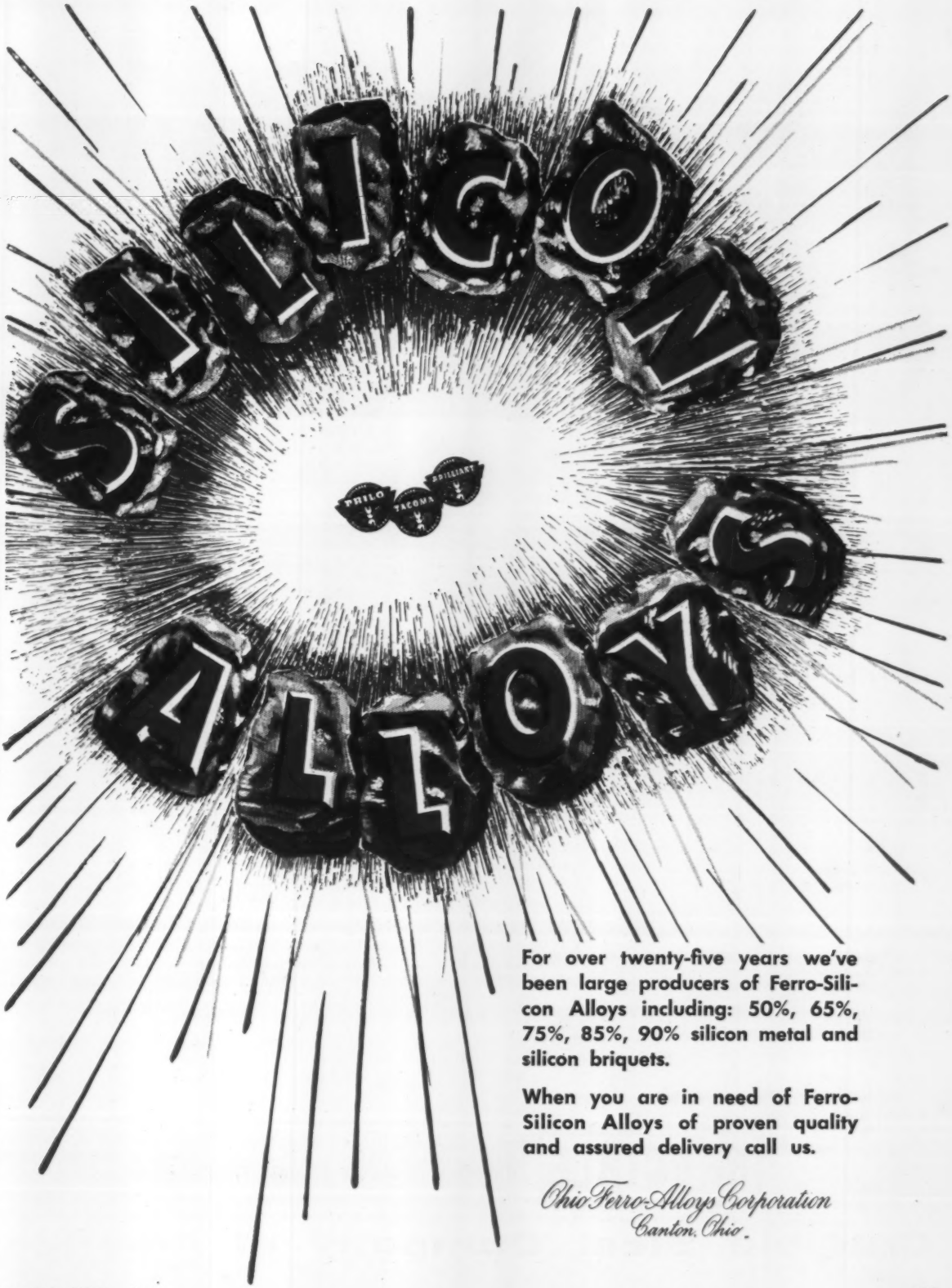
The program indicating panel is unusually graphic. Using lighted buttons and shapes, it shows the charging sequence of coke, stone and ore, the load cycle, position of the distributor, open or closed positions of both bells and location and direction of movement of each skip car. Different colored lights are used for coke, ore and stone. To prevent confusion, these colors are used for no other purpose.

Skip House—This is the location of the program selection panel. A battery of 72 simple switches permits almost unlimited variations and instant change in the charging sequence. The same panel board has an information display section and an annunciator "trouble shooting" section which indicates the location of a fault with lighted panels. The only red lights in the system are those that indicate trouble.

The electrical system is completely interlocked to prevent mishaps. For example, the scale hoppers can open only when a skip car is below; the large bell opens only when a preselected charge lies above it.

The control is a $150,000 answer to increasing demands being made on furnace crews: Larger volumes of materials are being put through furnaces, and greater charging accuracy is being required, especially with sinter.

The control is intended to promote efficiency—not replace men on the furnace crew.



For over twenty-five years we've been large producers of Ferro-Silicon Alloys including: 50%, 65%, 75%, 85%, 90% silicon metal and silicon briquets.

When you are in need of Ferro-Silicon Alloys of proven quality and assured delivery call us.

Ohio Ferro-Alloys Corporation
Canton, Ohio

Universal collapsing tap parts of **MAX-EL** alloy steel finish machined after full heat treatment

Considerable machining is required in the manufacture of parts for these taps. That's why Crucible MAX-EL® 3½ free machining alloy steel was chosen by the Geometric Tool Company, Division of Greenfield Tap and Die Corporation. For with MAX-EL you can rough machine, *then* heat treat even intricate parts before final machining *with no danger of distortion of the steel.*

But the best way to check the advantages of MAX-EL is to try it in your own shop. Like many other users you'll appreciate its superior machinability, freedom from distortion, deep hardenability characteristics, uniformity and quality. And you'll like the longer tool life you get by using MAX-EL.

For complete data . . . and *quick delivery* of MAX-EL alloy steels, from local warehouse stocks, call *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

Dock handling can be a bottleneck. With mechanized handlers "like" loads can be handled fast, safe, economically

Plan the Building for Handling

To get maximum benefits from lift trucks, you must arrange aisles, doors, shipping and receiving areas and work stations to minimize backtracking. Here are some rules and a check list

BUILDING limitations are the greatest deterrent to effective material handling methods.

"Avoiding such handicaps takes skilled planning," says W. A. Meddick, vice president, Elwell-Parker Electric Co., Cleveland. Here are some suggestions to consider when erecting a plant or modernizing an old one.

Flow — Most companies prefer one-story buildings so that material can flow in a straight line from receiving to shipping. With such a layout, work proceeds with minimum rehandlings, no backtracking and little work transfer.

If roads or rail lines prevent a straight flow, a U-shaped system is used sometimes. A central dock handles both shipping and receiving.

In either case, industrial trucks provide fast, economical handling. Trucks are also used for interwork-station or interdepartmental moves.

Piling—Most powered industrial trucks stack parts to ceiling limits, and get maximum use from storage space. At work stations,

Plan to take advantage of ceiling space. Most industrial trucks can stack pallets like this

they elevate loads to convenient working heights.

Here are some pointers for one-story layouts:

1. Locate incoming temporary storage as close to receiving areas as possible, consistent with the point of origin and the processing or assembly lines.

2. Where possible, move maximum loads from storage to work stations. This reduces trips and increases the amount of stock available at work stations.

3. Make sure that trucks which handle loads from the ends of production, assembly and packaging lines have sufficient capacity and speed, and are adequate to prevent bottlenecks.

4. Allow sufficient room to maneuver the trucks and their loads.

Multistory Buildings—Obviously, many companies can't have a one-story operation.

In multistory setups, the most important factor in smooth flow is a sufficient number of fast elevators. They should accommodate the largest loads and their carriers.

If elevators are small, use low-capacity, walkie-type trucks. Regular power trucks should take loads to and from elevator doors.

Here are some rules for elevator location:

1. On upper floors, locate the stored goods most often handled nearest to the elevators. This cuts down trips and speeds over-all handling.

2. On upper floors, put the end points of continuous lines as near to elevators as possible.

3. Elevators should be as centrally located as possible.

If your elevators won't handle the volume and you can't install additional units, try ramps, chutes or interfloor lifts. They can be invaluable to industrial trucks.

Another point: If ramps are installed, keep the grade easy.

Obstructions—Building columns should be spaced for maximum use of storage area. The size of the loads to be stored should determine the spacing as long as basic floor and ceiling loading are safe.

Don't ignore sufficient floor load capacity. Many well-planned systems must be ruled out because upper floors won't stand the gaff.

The Industrial Truck Association urges the use of qualified architects when figuring floor load capacities.

Don't forget to give doorways sufficient lateral and vertical clearance. Aisleways should be wide enough to accommodate trucks, plus their loads. Production areas should be opened up to allow proper maneuvering of trucks around work stations and machines.

Check These Points to Get More Out of Lift Trucks:

1. Determine the building type (straight, U, L-shape). Establish the best kind of material flow. Eliminate backtracking, rehandling.
2. Locate work stations, storage and service areas to minimize travel and backtracking.
3. If elevators are used, make sure they are big enough.
4. Space building columns to accommodate exact multiples of storage units.
5. Be sure floors are strong enough to carry the load you plan.
6. Make doorways and aisleways wide enough to allow trucks to maneuver.
7. Plan congestion-free production areas. Give trucks adequate access to and from work stations and machines.

Your Wickwire Rope Distributor and our sales engineer ... a helpful team

This sales engineer—an expert on the selection, installation and maintenance of our products—is with your Wickwire Rope Distributor every time he makes a call.

True, sometimes he's hundreds of miles away, working in the field or at the mill. Yet, even if he's not there in person, your Wickwire Distributor has the full assurance that sales engineers such as this one are *always* quickly available to help you.

It's just one more reason why your Wickwire Distributor knows he's got top-quality wire rope, slings and strand to sell . . . and that these products will serve you well.

4086

A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

New System Defines Lathe Sizes

Approved by many large builders, it will be considered as a possible standard. It also avoids the words "engine" and "toolmaker's" to describe a lathe type

EVER BEEN confused by lathe designations? Take a so-called 16-in. lathe. It may swing up to 20 in. over the ways but only 12 in. over the cross slide. Where does the 16 in. come in?

The lathe group of the National Machine Tool Builders' Association has approved a four-digit designator system that will tell the user exactly what size machine he's talking about.

Start—Although the system is not yet a standard (it must be submitted to the NMTBA board and the American Standards Association), it has been introduced.

All new models made at Monarch Machine Tool Co., Sidney, O., will bear the new labels—including models introduced in 1955 at the machine tool show.

Here's how the system works. The first two digits tell swing or clearance over the bed and carriage wings. The second two show swing over the cross slide. At Monarch, the 13-in. engine lathe becomes a 1610—16 in. over the bed, 10 in. over the cross slide.

Elaboration—Many models also are available with a raised swing that's engineered in the castings. When this is the case, the new system adds a designator. It follows the standard machine designator, separated by a hyphen. It tells the raised swing over the cross slide. The 1610 that has a raised swing to clear 13 in. over the cross slide is now marked 1610-13.

Nomenclature—The new system also does away with two of the old stand-bys in machine tool terminology. There's no longer room for the "engine" and "toolmaker's" labels.

In many cases, the difference between the two has disappeared. It used to be that a toolroom lathe got more precision parts, higher grade bearings and closer inspection than the production engine lathe. With today's requirements on tolerances and speeds, little of the differentiation remains.

A Monarch explanation: "It's true that a lathe for toolroom use must, as a rule, have more flexibility than one for manufacturing purposes. So on some models we furnish a standard complement of additional equipment. Machines with such equipment differences are designated with the suffix T."

The chart below compares the new and old designators for the Monarch Series 62 lathes.

Since the new system was O.K.'d by the lathe group of the powerful NMTBA, there's little doubt that other major lathe builders will change to it as they introduce new models and new lines—although there is no time limit. The system is voluntary.

Lathe Designations: New Vs. Old

Four Digit Designators	Standard Designators
1610	13-in. Engine
1610T	13-in. Toolmaker's
1610-13	13-in. Raised Engine
1610-13T	13-in. Raised Toolmaker's
2013	16-in. Engine
2013T	16-in. Toolmaker's
2013-16	16-in. Raised Engine
2013-16T	16-in. Raised Toolmaker's
2516	20-in. Engine
2516T	20-in. Toolmaker's
2516-19	20-in. Raised Engine
2516-19T	20-in. Raised Toolmaker's

Faster Deburring

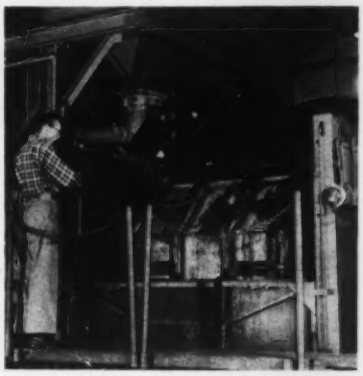
A TUMBLING machine speeded up a smoothing operation by 400 per cent.

Large precision assemblies for the J57 jet engine formerly were finished by hand at Solar Aircraft Co., Des Moines, Iowa. The new tumbling machine hones and polishes the sharp edges and nicks with an abrasive charge of aluminum oxide chips, pieces of mild steel wire and water.

Other advantages cited: Less damage to precise parts, better mating of parts in the engine, improved balance and increased life.

Finishing — The tumbler looks like a large rotary laundry washer with a 4-ft drum about 6 ft long. A central shaft in the machine holds up to 14 vane and shroud assemblies.

During tumbling, the parts are held rigidly while the barrel rotates so that the abrasive charge can wear them smooth and clean.



TUMBLING
. . . smooths finish faster

After each cycle, the abrasive charge is carried by a conveyor to an overhead hopper. Each new charge is gravity fed.

Before Solar obtained the tumbling units, the vane and shroud assemblies were deburred with hand air grinders, automatic vapor blast units and wash cabinets. Inspection showed a high percentage of nicks and scratches still remaining. They were removed by additional honing and polishing. More than 1 hour was usually required for the finishing cycle.

The tumbling unit was built for Solar by Almco Division of Queen Stove Works Inc., Albert Lea, Minn.

WASTE NOT, WANT NOT

Or how Cleve-Weld circular parts know-how can save you money...

CUSTOM-ORDER SECTIONS — We order special mill-rolled or extruded sections where quantities permit. These eliminate excess machining; hold costs to minimum. Sections above are for jet rings.

CUT YOUR WASTE COSTS up to 30% over bulky cast or forged parts with Cleve-Weld rings and bands.

THE CLEVE-WELD PROCESS is also ideally adapted to cut waste costs on complicated components.

From simple gear blanks to special alloy jet rings, material is no problem. We've worked with everything from carbon steel to titanium and the newest aircraft alloys. Many of today's leading jet engine manufacturers use *Cleve-Weld* rings for this reason.

Before you specify a casting or forging for a circular part, check CLEVE-WELD. We'll have our designers, metallurgists and production men study your drawings to see if we can save you money. Call —or write and send drawings to Circular Welded Parts Department, Cleveland Welding Division, W. 117th Street and Berea Rd., Cleveland 11, Ohio.

Another AMF Product

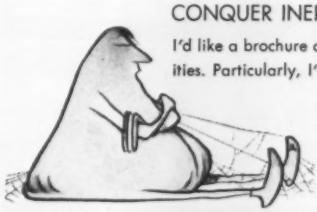
CLEVE-WELD PROCESS

RIMS - RINGS - WELDMENTS

CLEVELAND WELDING DIVISION

AMERICAN MACHINE & FOUNDRY COMPANY

Cleveland 11, Ohio



CONQUER INERTIA...MAIL THIS COUPON NOW! ST-704

I'd like a brochure on Cleve-Weld's metallurgical, design and production facilities. Particularly, I'd like to know how the Cleve-Weld Process can cut costs.

NAME_____

TITLE_____

ATTACH TO YOUR COMPANY LETTERHEAD AND MAIL TODAY!

March of Materials

Cleveland meeting will spotlight research in aircraft, missile and nuclear fields

PROGRESS of high temperature materials will be the theme of a conference at Cleveland's Hotel Carter, Apr. 16-17.

It will be sponsored by the Cleveland section of the American Institute of Mining, Metallurgical & Petroleum Engineers and the High-Temperature Committee of the Institute of Metals Division.

Guest speaker at a dinner on Apr. 16 will be rocket expert Willy Ley. His subject: "The Conquest of Nearby Space." He will discuss project Vanguard and what should and could follow it. Here is the program:

Tuesday, Apr. 16

10 a.m. STRENGTHENING BY MECHANICAL DISPERSIONS

Theories for high temperature strength of SAP.

Research on oxide-metal systems.

SAP type structures in titanium for elevated temperature service.

Dispersion hardened molybdenum.

1:30 p.m. COBALT AND NICKEL-BASE ALLOYS

Future of nickel-base alloys.

High temperature properties of nickel-base alloys using balanced experimental design.

Cast nickel-base alloy for turbojet engine bucket use at 1650°F.

W-545—new turbine disc alloy.

Future of cobalt-base alloys.

ML-1700 cast turbine bucket alloy.

Temperature dependence of secondary phase hardness in turbine bucket alloys.

1:30 p.m. GAS-METAL SYSTEMS AND OXIDATION

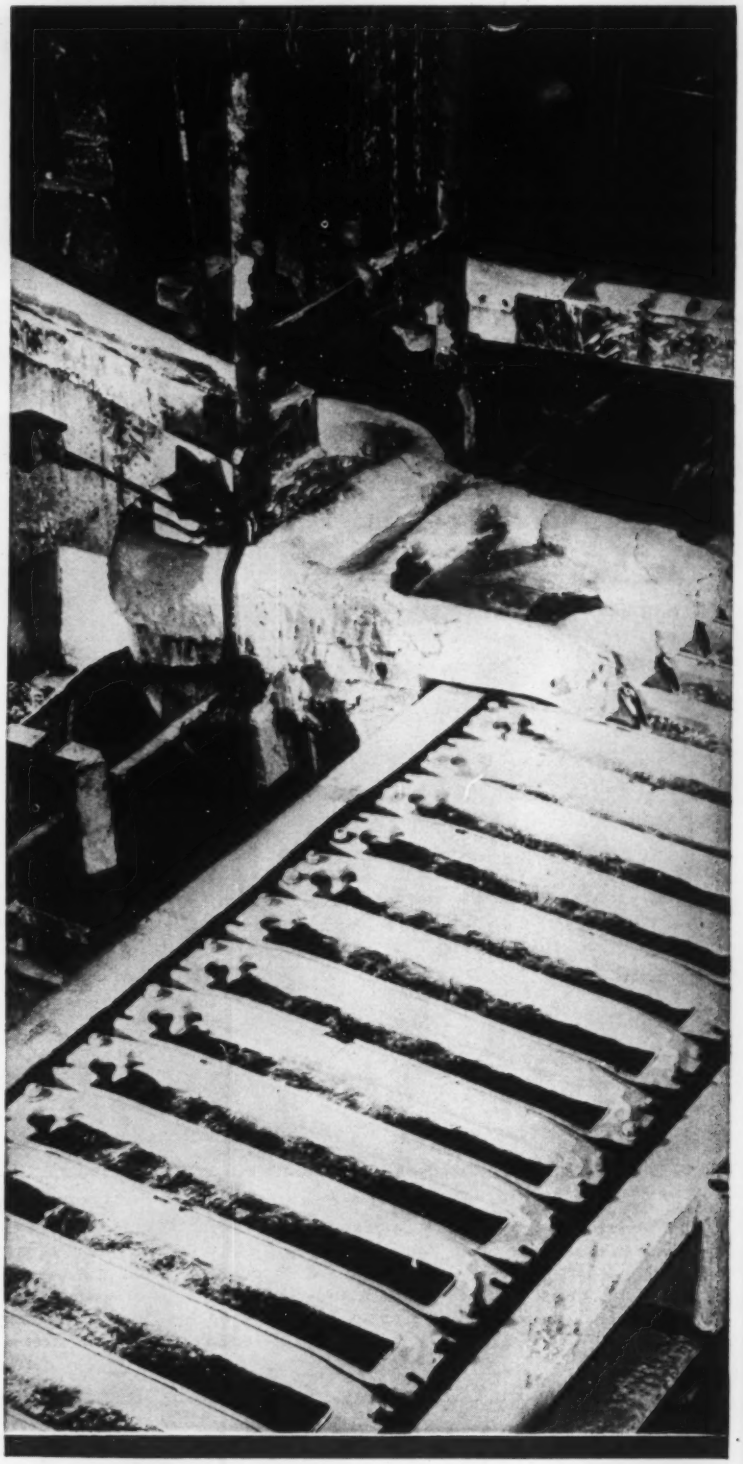
Columbium-hydrogen system.

Columbium-oxygen and columbium-titanium-oxygen systems.

Oxidation resistance of binary chromium-base alloys.

Oxidation of tungsten and molybdenum from 1800 to 2500°F.

High temperature oxidation of gas turbine alloys.



FEDERATED products:

Aluminum, Babbitts, Brass, Die Casting Metals, Fluxes, Lead and Lead Products, Magnesium, Plating Materials, Solders, Type Metals, Zinc Dust

Federated Aluminum Alloys always conform to published Performance Specifications

If you have had reason to doubt the performance capacity of certain aluminum alloys, it will pay you to consult Federated before you re-design or substitute another metal.

Often the performance requirements of a part indicate that a certain aluminum alloy will do the job; yet in operation, the part fails. Costly re-design or a more expensive metal are usually relied upon to rectify the trouble.

All aluminum alloys should provide the characteristics set for them in published specifications. At Federated's three aluminum plants, rigid quality control insures that production ingot adheres exactly to specified content. Impurities are held at or below the minimum allowable percentage.

Every heat of every Federated aluminum alloy is tested exhaustively. Refining, alloying and testing techniques are under the supervision of ASARCO's Central Research Laboratory, where scientists can control metal impurities to parts per million, if required.

A Federated field man will be around to see you soon. Spend some time with him. It will benefit you.

Federated Metals ASARCO

Division of

AMERICAN SMELTING AND REFINING COMPANY

120 Broadway · New York 5, N.Y.

Wednesday, Apr. 17

9 a.m. CERMETS AND INTERMETALLICS

Cermets and bonded hard metals.

Sintered titanium carbide.

Infiltrated titanium carbides.

Wettability and microstructure in liquid phase sintering.

Fracture and slip in cemented carbides.

Materials based on intermetallic compounds.

Cermets for gas turbine blades.

9 a.m. EFFECT OF TESTING ENVIRONMENT

Effect of testing environment on properties of alloys at high temperatures.

Effect of atmosphere on creep rupture.

Stress-rupture properties of nickel tubes at 1500°F.

Effect of testing atmospheres on creep rupture properties of molybdenum-base alloys at 1800°F.

2 p.m. REFRACTORY METALS

Chromium and its alloys.

Transition temperatures of chromium and chromium-base alloys.

Molybdenum, its alloys and protection.

Properties of molybdenum turbine buckets.

Experimental molybdenum-base alloys.

Tungsten, tantalum, columbium and rhenium.

2 p.m. EFFECTS OF VACUUM MELTING

Effects of vacuum melting on gas content and metal structure.

Quality control achieved by vacuum melting and effects on high temperature properties.

Vacuum melted vacuum cast nickel-base alloys.

Consumable electrode vacuum melting high temperature alloys.

Influence of crucible on creep rupture properties at 1600°F of vacuum melted 55 Ni, 20 Cr, 15 Co, 4 Mo, 3 Al, 3 Ti alloy.

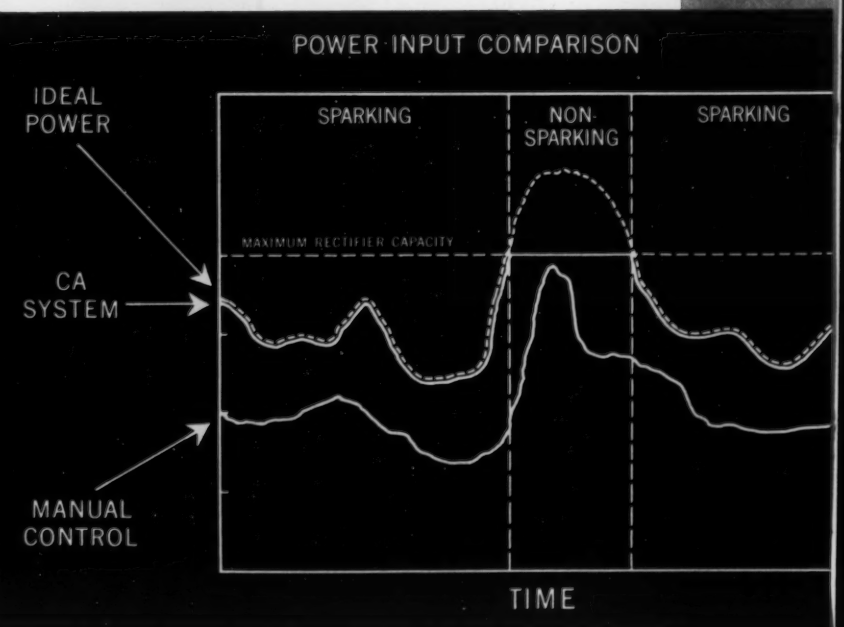
Effect of vacuum melting on high temperature properties of nickel-base superalloys.

You can register in advance by sending a check for $10 (for AIME members $5) to D. J. Berger, AIME Regional High Temperature Materials Conference, Clevite Research Center, 540 E. 105th St., Cleveland 8, O.

RESEARCH-COTTRELL'S

New CA System brings Auto to precipitators

Higher "around-the-clock" collection efficiency without any manual adjustments. That sums up the major advantages of Research's new Cottrell Automation System.



The chart at the left shows how the CA System provides these advantages. As you know, ideal electrical power input to a precipitator is not constant. It varies with changes in gas composition, temperature, rate of flow and humidity, as well as characteristics of the dust, such as size, electrical resistivity and extent of build-up on the electrodes. With conventional controls, manual adjustments cannot keep pace with these changing conditions. This difference between *ideal* electrical power and *actual* power input, under manual control, is shown in the chart. This

mation

difference means lower collection efficiency.
The fast acting electronic circuits of the CA System provide the best practical approach to ideal electrical power. During periods of sparking, electrical power input is controlled by the optimum sparking rate, which can be easily pre-set to any value between 0 and 500 sparks per minute. Under some conditions power input would have to be increased beyond the capacity of the electrical equipment in order to maintain this optimum sparking rate. During such periods the power input is governed by the *capacity* of the electrical equipment. This condition is shown in the center vertical section of the chart.
For more information on this new automation development write for your copy of Bulletin CA. It has a detailed description of how the Cottrell Automation System works and how higher "around-the-clock" collection efficiencies and lower operating costs are obtained.

Research-Cottrell

RESEARCH-COTTRELL, INC., Main Office and Plant: Bound Brook, New Jersey • 405 Lexington Ave., New York 17, N. Y.
Grant Building, Pittsburgh 19, Penna. • 228 No. La Salle St., Chicago 1, Ill. • 111 Sutter Bldg., San Francisco 4, Cal.

Now...Cannon-Muskegon offers complete

Now available are:

stainless, tool and die, magnetic steels— high-temperature, corrosion-resistant, expansion alloys — bearing steels — electrical and electronic alloys — special alloys

RIGHT NOW . . . Cannon-Muskegon provides you with a ready source of super-clean, superior strength alloys to meet complex metallurgical applications. Our completely equipped and expertly staffed vacuum melting facilities as well as chemical, physical and metallurgical laboratory can help you *find, test and produce* vacuum melted alloys for any application . . . in test or production quantities . . . with accurately predictable properties.

Ferrous, nickel and cobalt-base alloys are poured at pressures from 1 to 10 microns — resulting in extremely clean metals for smoother surfaces . . . greater tensile strength, ductility and wear life . . . and higher electrical and magnetic properties. Contact Cannon-Muskegon for facts.

We offer industry

- ***Materials for remelt*** — under conventional air melting, inert gas, vacuum.
- ***Casting development*** — includes research and experimental facilities for investment, shell mold, dry sand, and permanent mold castings.
- ***Ingots or cast billets*** — for rolling, forging or extruding in individual weights up to 250 pounds.

Finest laboratory and production equipment is used in our vacuum-melting operation . . . available to you. Let our metallurgical specialists help you solve your alloy problem.

For full particulars write for our New Bulletin on Vacuum-Melting and Air-Melting facilities, products and service.

ULTRA MET
VACUUM-MELTED ALLOYS
FOR INDUSTRY

CANNON-MUSKEGON CORPORATION

2893 Lincoln Street Muskegon, Michigan

METALLURGICAL SPECIALISTS

Raises Machine

Fast and accurate adjustments of heavy equipment are easy with worm gear jacks

HOW to raise and lower a 300-ton machine accurately was the problem.

Engineers at the Blaw-Knox Co., Pittsburgh, solved it with three screw jacks made by Duff-Norton Co., Pittsburgh.

Said to be one of the world's largest, the machine is a beam straightener for U.S. Steel's Homestead (Pa.) Works. It will handle wide flange beams as large as 24 in.

Adjustment — Jacks raise and lower the machine about 6½-in. Two sets of three on either side of the machine are connected in series. Each set is driven by a 7½-hp motor.

The adjustment accommodates changes in the sizes of beams being rolled. Approach tables are fixed so the pass line of the straightener is raised or lowered.

The straightener has four top rolls, each of which can be adjusted individually, and five lower ones. Both top and lower rolls can be adjusted horizontally.

JACKS
. . . adjust the pass line

Alternate — Although motors power the worm gear jacks, they can also be operated by hand cranks or handwheels. Light loads can be lifted with the handwheel alone.

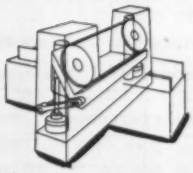
The jacks do not have seals or packing and require little maintenance. They operate efficiently even though they remain stationary for long periods.

Heavy Cut-off Work
Now Done with Band Sawing Economy

Forge Blocks
Rounds · Bars
Tubing · Pipe
Structurals

DoALL

POWER SAW
24″ x 24″ Capacity
HEAVY DUTY Horizontal CUT-OFF SAW



HORIZONTAL SAWING HEAD
Unique design insures ample power and rigidity for new rugged beam 2″ wide Demon HSS Saw Band. You get heavy cuts at high speed, long band life at low tool cost.

New Design packs power, rigidity and speed for the big cut-off jobs.

Here's a machine that was designed *from the ground up* to meet a growing need by steel mills and warehouses, shipyards and other fabricators for high speed, dead accurate cut-off of heavy work pieces.

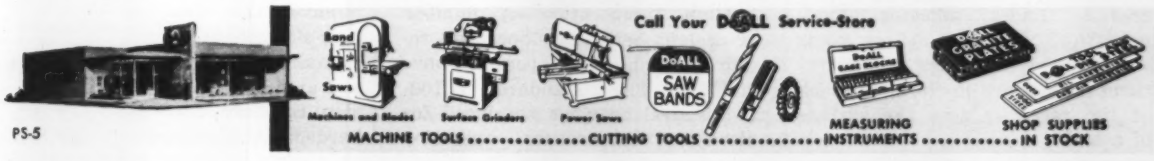
The new DoALL Power Saw Model 24 packs power, rigidity and speed behind a new rugged, continuous cutting 2″ wide Demon HSS band. It will cut heavy bars, pipe, billets and structural shapes in a fraction of the time *at a fraction of the cost* of any cut-off machine of comparable capacity. And the narrow-kerf cut will give you a bonus of many more cuts per piece in material savings alone!

Its revolutionary horizontal design results in a combination of structural simplicity, speed and accuracy of cut with new ease of handling heavy work. Variable speed, fluid drive, complete automatic operation, automatic indexing of blanks up to 12′ long, and power positioned hydraulic vises are just a few of the revolutionary time and money saving features of this new Power Saw. Call your local DoALL Sales-Service Store for details on this outstanding investment today or write: The DoALL Company, Des Plaines, Ill.

FEATURES

- *Finger tip control* for instant response to change in speed or direction. (Manual control also available.)
- *Powered rollers* position the heaviest work pieces
- *Fluid drive speed control* meets broad range of cutting requirements.
- *Automatic indexing table*
- *Power positioned hydraulic vises*
- *Automatic self-drain chip removal*
- *Positive feed coolant system*

For Lowest Cost . . . do it on the DoALL!



PS-5

BEARINGS FOR TOUGH JOBS

1

. . . Difficult Environments

Extremes of heat, lack of lubrication, oxidation and magnetism make it tough on the ball bearing designer. Here's where he looks to solve his problems

EVEN UNDER lightly loaded conditions, contact stresses between balls and races generally exceed 100,000 psi and may be as high as 500,000 psi. Excellent life records of ball bearings are attained only by the most careful attention to material quality, William Blinder, senior research and development engineer with General Motors' New Departure Division, points out in the *General Motors Engineering Journal*. Here is what he says:

In most applications, speeds, loads and temperatures are low enough to impose few problems. Under such conditions, ball bearings are relatively insensitive to type and quantity of lubrication. But they are sensitive to mounting fits and alignment, dirt and other contaminants.

Materials—The two most generally used for ball bearings are high carbon, high chromium steels —AISI modified 52100 for rings, and AISI modified 51100 for balls. Basically, they are 1 per cent chromium, 1 per cent carbon, electric furnace steels used in the fully hardened condition tempered to 62-64 Rockwell C. They are among the cleanest of the high-tonnage materials.

Cleanliness is extremely important since nonmetallic inclusions are a major cause of fatigue failures. Oxides, silicates, aluminates and sulphides act as voids which produce stress concentrations if they are in the load track of the races or near the surface of a ball.

The two other most common materials are AISI 440C stainless steel for mildly corrosive conditions and AISI 5120, a high quality case hardening steel for bearings which need a ductile core for toughness or high impact strength. Separator, or cage, materials are generally 1010 steel or 430 stainless of stamped-ball controlled design for low or normal speed conditions. Fabric base phenolic or bronze ring controlled separators are used for high speeds.

Properties—Ball and ring materials should have certain definite properties. Those below are desirable, but compromises usually must be made to obtain a suitable combination:

- High endurance under fatigue loading.
- High impact strength.
- Hardness high enough at operating temperature to carry the load without permanent deformation.
- Good galling and wear resistance with the lubricating medium used.
- Corrosion resistance.
- Dimensional stability.
- Uniformity and freedom from segregation.
- Reasonable cost of material and processing.

High Temperature—A number of designs being developed will require bearings to operate above 450°F. The standard 52100-51100 steel bearings stabilized for elevated temperature operation have been successful up to 450°F (in some cases above). But above 300°F, structural and dimensional changes occur due to the transformation of martensite. The rate of change increases with temperature. Bearing capacity and life are decreased.

Materials having the greatest promise for 900 to 1000°F service are the high speed tool steels. They have good hot hardness, dimensional stability and high temperature strength because of their tungsten, cobalt, molybdenum and vanadium contents. This class of materials has a basic disadvantage As commercially made, their nonmetallic inclusion content is often high. This leads to early bearing failures.

Clean Steel—Considerable progress has been made in the production of high speed tool steels which are cleaner than bearing quality 52100. Air-melted steels and properly controlled vacuum-melted steels of the same analysis show a marked difference in inclusion content.

Endurance test results of ball bearings made of clean materials show great improvement in average life and percentage of early failures. But vacuum melting in itself is no guarantee of acceptable quality. Rigid inspection must be continued.

Corrosion—Materials with corrosion resistance are required for operation in pressurized water at temperatures up to 600°F, in air or inert gas at temperatures up to 1600°F and in corrosive gases. Lubrication (other than by the medium in which the bearings operate) is generally not possible under such conditions, so compatibility of materials and wear resistance are important requisites.

Many bearings meeting these qualifications are needed in the food processing industry. Cobalt, chromium-base, nickel-base and copper-base alloys have been used —in some cases with good results. Laboratory tests have been run on materials such as sintered tungsten carbide, sintered chromium carbide, glass, sapphire and graphite.

Stainless—The stainless steels are an important group of corrosion resistant materials. Of the hardenable types, perhaps the best

known is 440C, a standard bearing material. The endurance characteristics of commercial bearings made of this material are adequate for most applications.

However, 440C stainless steel is magnetic and is stainless only when hard and polished. Since its hot hardness is poor, it generally is not recommended for service above 500°F. Nonmagnetic bearing materials are occasionally required where conventional bearing materials may disturb equipment operation or where an accidentally magnetized bearing may radiate a radio signal.

Two Roads—The ball bearing industry is furnishing special bearings for use under conditions thought impossible only a few years ago, but unfortunately many customer requirements cannot be met.

The answer to successful operation above 450°F appears to be either:

1. Development of a lubricant or lubrication system which can withstand these temperatures.

2. Development of a material or a combination of materials which can operate with minimum external lubrication.

BALL BEARING MATERIALS

Ball and Ring Materials	Temp °F	Hot Hardness	Gall Rating	Oxidation Resistance	Magnetic	Bearing Fatigue	Comment
Bearing quality standard AISI 52100 and 51100 steels	100 300 500 700	Excellent Excellent Fair Poor	Good Fair Poor Poor	Fair Fair Fair Fair	Yes Yes Yes Yes	Excellent Excellent Fair Poor	Standard ball and ring material. Requires stabilization for use at temperatures above 300°F.
440C stainless steel	100 300 500 700	Excellent Excellent Fair Poor	Poor Poor Poor Poor	Good Good Fair Poor	Yes Yes Yes Yes	Good Good Fair Poor	Standard ball and ring material for use under mildly corrosive conditions. Martensitic stainless steel. Has good resistance to tempering but poor hot hardness.
Vacuum melted, high speed tool steel (5% Cr, 5% Mo, 0.65% C)	100 300 500 700 1,000	Excellent Excellent Excellent Good Fair	Fair Fair Fair Fair Fair	Fair Fair Fair Fair Fair	Yes Yes Yes Yes Yes	Excellent Excellent — — —	Low critical alloy, high speed tool steel. Has given excellent endurance life when tested up to 400°F. Used in jet engine bearings.
Air melted, high speed tool steel (5% Cr, 5% Mo, 0.65% C)	100	Except for fatigue strength, other properties are similar to those for the vacuum-melted steel above.				Poor	Same as above but, as commercially made, is too dirty.
Cobalt, chromium, tungsten base alloys	100 500 900 1,200	Good Good Good Fair	Good Good — —	Excellent Excellent Excellent Excellent	No No No No	Fair Fair Fair —	Used in high temperature corrosive applications. Exhibits excellent wear resistance.
Beryllium copper	100	Fair	Good	Excellent	No	Fair	Used for low temperature, nonmagnetic, and/or corrosive applications. Retains high impact resistance at liquid-air temperature, thus used for such conditions.
Sintered tungsten carbides	100 300 500 700	Excellent Excellent Excellent Excellent	Good — — —	Excellent Excellent Excellent Excellent	Yes Yes Yes Yes	Poor — — —	Not presently used as bearing material because of poor fatigue resistance.
Ceramics and cermets	Up to 1,600	Excellent	—	Excellent	—	—	This class of materials is being evaluated for extreme conditions.

SEPARATOR MATERIALS

Separator Material	Temp °F	Gall Rating	Oxidation Resistance	Magnetic	Comment
1010 steel	Up to 500	Fair	Poor	Yes	Standard separator material for low speed or noncritical applications.
Fabric base phenolic	Up to 275	Excellent	—	No	Standard separator material for high speed bearings.
430 stainless steel	Up to 1,000	Poor	Excellent	No	Standard separator material for low speed 440C stainless steel bearings.
17-4-PH stainless steel	Up to 1,000	Poor in air	Excellent	Yes	Successfully used in high temperature water applications. Has good wear resistance.
Iron silicon bronze	Up to 450	(1)	Excellent	No	Used for jet-engine applications, as well as other high speed, medium temperature bearings. (1) Gall rating ranges from good at 100°F and 300°F to excellent at 500°F.
S-Monel	Up to 1,000	Fair	Excellent	No	Has excellent high temperature strength. Used for temperatures above the limits of iron silicon bronze.
Silver plate	(2)	(3)	Excellent	No	Successfully used in many journal bearing applications. (2) Provides good results in many difficult ball bearing applications at temperatures up to 350°F. (3) Gall rating ranges from excellent at 100°F and 300°F to poor at 500°F and 700°F.

Source: General Motors Engineering Journal.

BEARINGS FOR TOUGH JOBS

2

. . . High Temperatures

Above 250°F, heat becomes a major factor in ball bearing life. Here are some guides to follow as temperatures in which bearings operate go zooming up

THE TABLE below gives an insight into the high temperature problems confronting bearing manufacturers and users. For example, in the 600-1000°F range there is no satisfactory lubricant. Most research has been confined to oscillatory or slow speed operation without lubrication. Wear is rapid, and life short. (But in an expendable missile, no component is long lived.)

Research in the 1000°F range on unlubricated ball bearings made of such materials as carbides, Stellites and ceramics is in its infancy, G. H. Raley, engineering manager, standards and procedures, Fafnir Bearing Co., New Britain, Conn., points out.

Even for lower "high" temperatures, no one general recommendation can be made. The conditions of each installation must be studied to determine peak and operating temperatures, load as a per cent of bearing capacity, oscillating or rotational service conditions and presence of vibratory conditions. Fafnir engineers cite a rough guide:

Materials — Bearing materials have certain limitations of operating temperature range. SAE 52100 and SAE 51100 must be stabilized against growth for operation above 300°F and up to 450°F. Small bearings with loose internal fit need not be stabilized to operate up to 450°F. Above 450°F, high speed tool steels such as M-2 (moly tungsten type), T-1 (tungsten type) and M-10 (moly-vanadium type) should be used.

Bearing capacities should be downrated to 90 per cent at 300°F through 60 per cent at 450°F on an approximately linear basis for SAE 52100 steel. There is no information on the fatigue life of the M-2, T-1 and M-10 high speed steels. It is recommended that bearing capacities at 100 per cent of rated value be applied at all temperatures.

Retainers—Composition Grade L retainers are made of a phenolic-resin laminate, generally recommeded for operation at temperatures not higher than 250°F. A special Grade L laminate is operable up to 450°F but is not readily available—it is generally flat stock, which restricts it use. AISI 1008 pressed steel retainers can be used up to 450°F if bearing speeds are reduced in the 300 to 450°F range. AISI 430 stainless steel retainers can be used on light to medium loaded bearings from 450 to 600°F. For heavy loads in this range, machined metallic retainers made from iron silicon bronze, S— or H— Monel are recommended. The last two are scarce and hard to machine. The bronze retainer is highly satisfactory in this range.

Seals—Buna-N seals can be used up to 300°F. Beyond 250°F, this material becomes brittle but remains effective. After operation at this elevated temperature, Buna-N seals would be destroyed in removal. AISI 1008 pressed steel shields may be used up to 450°F.

When contact seals are required above 300°F and up to 450°F, Teflon-coated glass fabric may be used. This material has a low coefficient of friction and a slow rate of embrittlement. At 400°F, it starts to decompose slowly, giving off minute amounts of fluoride compounds. The possibility that they may contaminate an installation should be investigated before Teflon sealed bearings are specified.

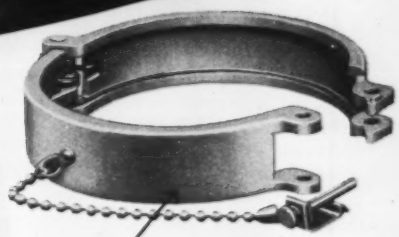
Lubrication—Greases covered by the MIL-G-3278 specification may be used between −67°F and +250°F. MIL-L-3545 greases are satisfactory from −30°F to +300°F. Between 250°F and 450°F, Dow-Corning DC-44 and Keystone 89H greases may be used, and will provide more satisfactory service if the installations are designed for relubrication. Both are lithium soap silicone oil compounds.

HIGH TEMPERATURE BEARING MATERIALS

	−67 to +250°F	250 to 300°F	300 to 450°F	450 to 600°F	600 to 1000°F*
Rings	52100	52100	52100 with stabilizing heat treatment	M-2, T-1, M-10 high speed tool steels	M-2, T-1, M-10 high speed tool steels
Balls	51100	51100	51100 with stabilizing heat treatment	M-2, T-1, M-10	M-2, T-1, M-10
Retainers	Phenolic resin laminates, pressed steel AISI 1008	Phenolic resin laminates, pressed steel AISI 1008	Stainless steel, pressed steel for slow speeds only	AISI 430 stainless, iron silicon bronze, S-and H-Monel	Iron silicon bronze, S-and H-Monel, machined or full type
Seals and Shields	Pressed steel and Buna-N	Pressed steel and Buna-N (brittle above 350°F)	Stainless and pressed steel, Teflon-coated glass fabric (begins decomposing at 400°F)	Stainless steel	Stainless steel shields
Lubricant	MIL-G-3278 (−67 +250°F), MIL-L-3545 (−30 +300°F) greases	Lithium soap-silicone oil compounds DC-44 and Keystone 89H	Lithium soap-silicone oil compounds DC-44 and Keystone 89H	None, or full flow, high quality mineral oil	None

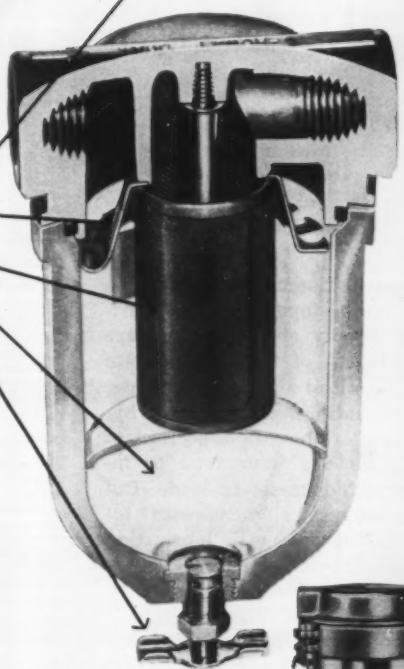
*Oscillation or slow speed only. High torque and wear due to lack of lubrication.

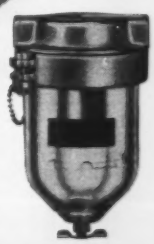
REDUCE AIR-EQUIPMENT WEAR with NEW Norgren AIR LINE FILTERS!



NORGREN FILTERS...

- ***Improve Air-Equipment Operation***
- ***Reduce Corrosion***
- ***Reduce Wear from Abrasion***
- ***Lower Maintenance and Repair Costs***





NORGREN AIR LINE FILTERS PROVIDE THESE IMPORTANT BENEFITS...

83% LESS PRESSURE DROP

GREATER LIQUID REMOVAL

COLLECTED MOISTURE IS TRAPPED in Quiet Zone

SIMPLIFIED MAINTENANCE—easy-to-operate clamp-ring.

CHOICE OF 3 INTERCHANGEABLE FILTER ELEMENTS—74-micron Monel wire screen, 64 or 25-micron sintered metal.

AUTOMATIC OR MANUAL DRAIN FILTERS AVAILABLE

For complete information, on all your filter needs, ¼" to 1½" inclusive, call your nearby Norgren Representative listed in your telephone directory—or WRITE FACTORY FOR LITERATURE.

C. A. NORGREN CO.

3412 SO. ELATI STREET • • • ENGLEWOOD, COLORADO

BEARINGS FOR TOUGH JOBS

3

. . . Nuclear Reactors

Those used in a Canadian atomic reactor operate with water lubrication or none. Here's what the search for good bearing materials turned up

THE CHALK river nuclear reactor in Canada requires bearings which operate with only water lubrication or no lubrication. To solve some of the problems, tests were made at the Ontario Research Foundation, Toronto, on machines designed to simulate conditions of load, speed and lubrication.

Design of the test machines and test results were reported recently by Alexander Boyd, research fellow of the foundation. Findings are summarized in the table. Among conclusions reached were:

A combination of materials which never attains hydrodynamic lubrication usually shows an increase in coefficient of friction and rate of wear as load and speed increase. In combinations which attain hydrodynamic lubrication, coefficient of friction and wear tend to increase with increase in load. But they decrease slightly with increasing speed until lubrication changes from boundary layer to hydrodynamic type, at which point friction and wear drop near zero.

Smoothness—Rate of wear and coefficient of friction remain approximately constant after initial running in. Smoothing a surface (although necessary) destroys the structure at the surface and initially lowers wear resistance.

Materials appear to have to fall into two categories to give low friction and wear: 1. Those with considerable hardness or resilience. 2. Those with self-lubricating qualities.

Hardness—The harder the material, the more it can be relied on to have satisfactory wear properties and a low friction coefficient. The hard surface resists abrasion and has few rough spots which plow into and lock with a mating surface.

A hard surface forms on 416 stainless steel due to sliding cold work. The hard skin believed to form on nylon is probably a similar phenomenon. Resilience of plastics also allows their surfaces to yield to rough mating surfaces without actually being penetrated.

Lubricity—Good friction and wear behavior of softer materials can be attributed to factors which aid in lubrication of sliding surfaces. Tin in an aluminum alloy tested exuded onto the sliding surface; small pockets of water are held all over the surface of sintered stainless steel. As load goes higher, more of the soft constituent is pressed out onto the surface and the coefficient of friction and wear may become less.

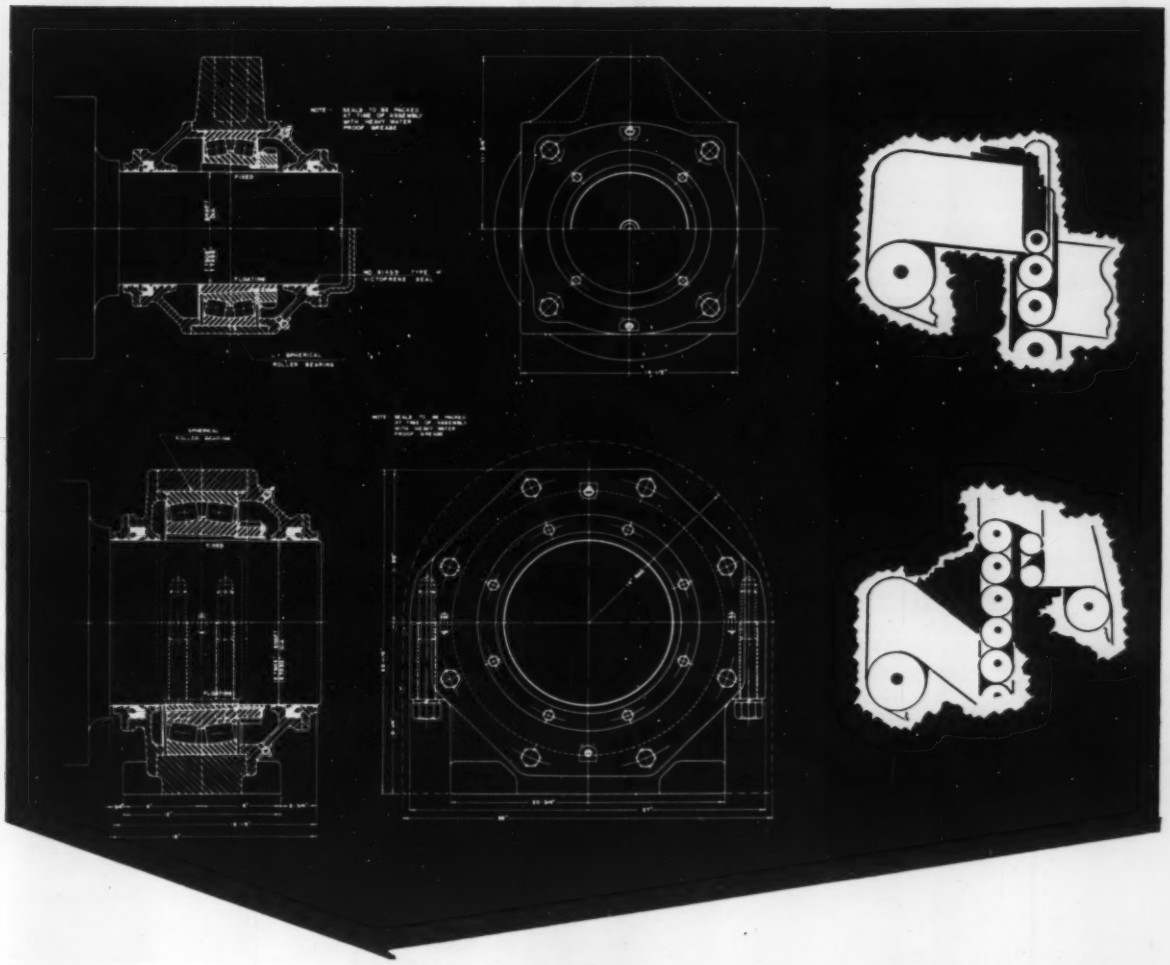
Both hard-against-hard and soft-against-hard materials can be expected to give good results. The third possibility, soft-against-soft (pocket lubrication types) is unlikely to give good results, the hard spots on one surface interlocking with those on the other. K-Monel, magnesium J-1 and titanium fitted none of the categories. Their results were poor.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.

BEARING MATERIALS FOR NUCLEAR REACTORS

		WATER LUBRICATION				UNLUBRICATED	
Slider	Slide	Low speed, low load	Low speed, high load	High speed, low load	High speed, high load	High speed, low load	High speed, high load
Electrolized stainless (1)	Electrolized stainless	x	x	x	x		
Hastelloy D	420 stainless	x	x	x	x		
Stellite No. 3	Stellite No. 3	x	x	x			
Bakelite, cloth filled	416 stainless	x		x			
Alundum	Alundum	x	x	x	x		
Sintered 316 stainless	S-Monel	x					
Leaded bronze	416 stainless	x	x				
Aluminum No. 1 (2)	416 stainless		x		x		
Aluminum No. 1 (2)	S-Monel	x			x		
F-A bronze (3)	416 stainless	x		x	x		
Hard chrome	Hard chrome		x	x	x		
Teflon	416 stainless				x		
Bronze with Molykote	416 stainless					x	
Rulon B (4)	416 stainless					x	x
Nylon	416 stainless					x	
Aluminum with Molynamel	416 stainless						x
Sintered stainless with Molynamel	416 stainless						x

Chromium (96 per cent) alloy coating deposited by proprietary process.
Aluminum No. 1: 7 Sn, 1 Cu, 1 Ni, 2.5 Si, + Al.
F-A Bronze: 83 Cu, 12.5 Al, 4 Fe, 0.5 impurities.
Teflon with a lubricating solid added by a proprietary process.



a Bearings, Inc. engineered change-over with a built-in plus!

One of our paper mill customers was getting varying caliper readings from center to roll end as the paper came through his calenders. Our investigation showed water-cooled plain bearings were causing a variation in roll diameter from roll end to center.

Our solution was to replace this installation with large bore spherical roller bearings, tapered sleeve mounted with cast housings designed by our Bearing Engineers.

The result? 100% success! No longer are they troubled by roll diameter variations. The PLUS of less maintenance and elimination of frequent bearing replacement . . . the fact that water cooling was no longer necessary, paid for this change-over within a short time!

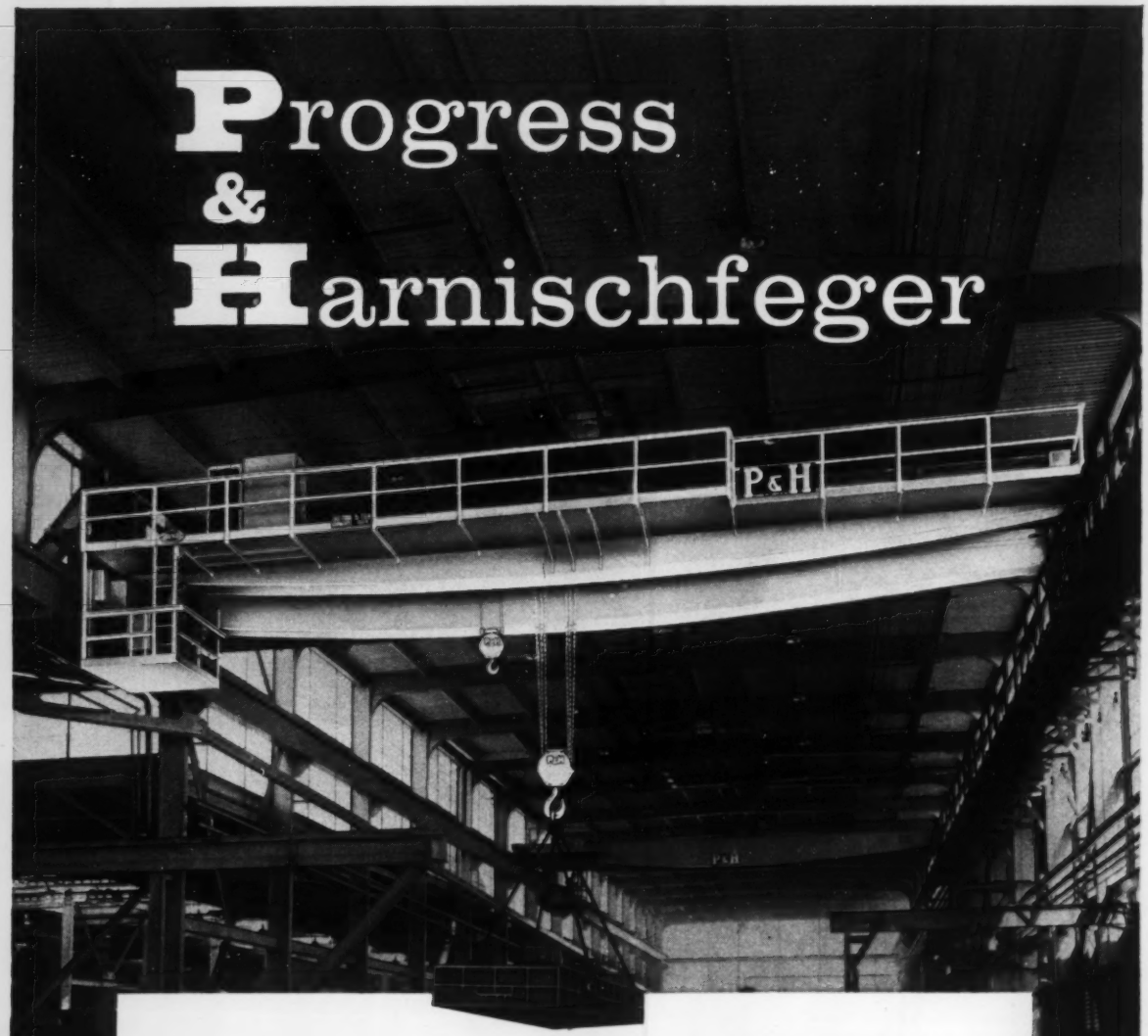
This is just one of many examples of our *complete* bearing service to *all* industry. Our ability to solve difficult bearing problems is second only to our service in supplying all types and quantities of replacement bearings from the complete list of nationally known bearings we are authorized to distribute!

Rendering bearing service in the territories adjacent to our branches, listed below.

BEARINGS, INC.

OHIO: Akron • Canton • Cincinnati • Cleveland • Columbus • Dayton • Elyria • Hamilton • Lima • Mansfield • Toledo • Youngstown • Zanesville
INDIANA: Ft. Wayne • Indianapolis • Muncie • Terre Haute
PENNSYLVANIA: Erie • Johnstown • Philadelphia • Pittsburgh • York
WEST VIRGINIA: Charleston • Huntington • Wheeling
NEW JERSEY: Camden • **MARYLAND:** Baltimore
DELAWARE: Wilmington •
Subsidiaries: Balanrol Corp. • Buffalo, N.Y.• Kentucky Ball and Roller Bearing Co. • Louisville, Ky.

A two-word history of the overhead-crane industry!



. . . and now a NEW concept– P&H electronic "stepless" control

In overhead cranes, P&H has steadily pioneered new crane design. Now, P&H again moves years ahead of the industry with the modern concept — electronic, "stepless" control . . . excellent control response coupled with extreme simplicity. There are 60% fewer wearing parts in this new overhead crane control.

From P&H you get the most modern crane built—and one that stays modern, as this new control can be applied to existing AC-crane installations.

Write for detailed information and data on this money-saving development, "Electronic Crane Control." Address Dept. 100E, Industrial Division, Harnischfeger Corp., Milwaukee 46, Wis.

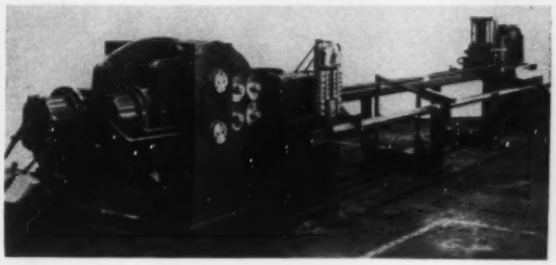
HARNISCHFEGER
P&H INDUSTRIAL DIVISION
MILWAUKEE 46, WISCONSIN

Centerless Bar Turner Finishes 12 Ft a Minute

Carbon or oxide cutting tools are used with the Medart RFPD bar turner to machine alloy steel or nonferrous metals.

The machines handle bars ⅜ to 6 in. in diameter.

Bars are fed into the machine through automatically centering feed rolls. The rolls push the bar through a patented torque chipping set of tools that absorb the torque of the cutting tools and limit chip length. *Write*: Blaw-Knox Co., 300 Sixth Ave., Pittsburgh 22, Pa. *Phone*: Grant 1-4404



Air Gage Inspects Large Inside Diameters of Narrow Parts

The Precision air gage consists of an angled spindle incorporating three sets of gaging cartridges connected to a three-column gage.

The gage is easy to load and unload. No loading platform is needed, and parts do not become cocked or hung on the spindle.

The inspector presents the part to the spindle and glances at the position of the floats in the gage to read average diameter and out of roundness.

The illustration shows one of the new gages being set up with a master setting ring to check automobile flywheel ring gears. *Write*: Standard Production Instruments Division, Sheffield Corp., Dayton 1, O. *Phone*: Kenmore 3131

Automatic Screw Machine Holds Dimensions to 0.0005 In.

Model No. 2 has production cycles of 1 2/3 to 480 seconds. More than one piece can be made in a cycle.

The machine is available in three capacities—¾, 1¼ and 1½-in. in terms of maximum stock diameters. The larger machine has 16 high spindle speeds; the other two models have 18 high spindle speeds.

Top speeds: 5050 rpm on the ¾-in. capacity spindle, 3500 rpm on the 1¼-in. model and 2450 rpm on the 1½-in. machine.

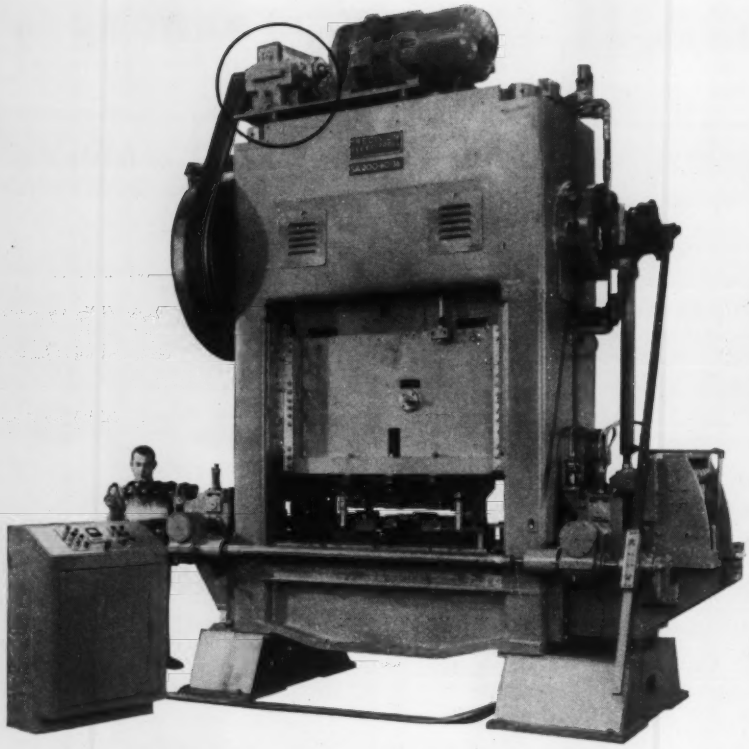
In combination with each high speed, 11 or 12 low speeds can be used in ratios from 2.2:1 to 15:1.

Speed and direction of spindle rotation are selected by a set of 18 change gears. Spindle driving chains and sprockets are not changed.

A positive chain drive is used by the spindle at all speeds.

A quick-acting tool clamp on the vertical slide holds the cutoff tool. This frees a cross slide for additional tooling.

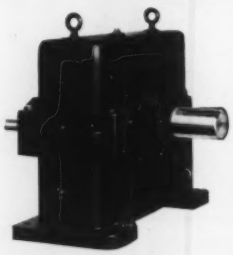
Other features: Positive stopping, convenient control panel, automatic lubrication, hardened and ground steel ways. *Write*: Brown & Sharpe Mfg. Co., Providence 1, R. I. *Phone*: Dexter 1-5000



H & S speed reducer helps increase Flexopress drive efficiency!

Located in the Hayes Industry Plant at Jackson, Michigan, this Flexopress has greatly increased production efficiency. Operating at double the slide speed previously obtainable, it's the world's fastest press for comparable size and stroke.

A high speed motor was specified for greater operation economy. Resultant high shaft speed had to be reduced to desired flywheel speed. For this, Precision's engineers selected a compact, easy-to-install H&S speed reducer as the neatest and most efficient drive linkage available.



H&S RS1600 Speed Reducer

Perhaps you, too, can benefit from our years of speed reducer and industrial gear engineering experience. If you are looking for dependable, trouble-free power transmission, won't you contact your H&S representative or write us today?

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 Hamilton Avenue
Cleveland 14, Ohio

Send note on company letterhead for H&S Reducer Catalog No. 55

NEW PRODUCTS and equipment

Magnesium Dock Boards

These boards for concrete docks adjust to the floor levels of truck or trailer floors automatically.

They swing up and out of the way when not in use. Safety curbs

protect power truck tires. Curb ends are flared for safe wide angle turns.

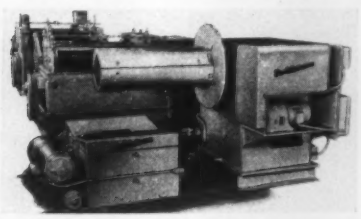
Beveled edges prevent loads from jarring. *Write*: Magline Inc., Pinconning, Mich.

Press Feed Line

Coiled stock is loaded onto a reel, flattened, measured to proper length and fed into a press by these machines. They include a coil lift, coil reel, edge trimmer, scrap chopper, a press feed unit and control panel.

The lift hydraulically raises a coil to the correct height and positions it on the mandrel of the coil reel.

The reel pays off the material into the machine line. A 1½-hp threading unit helps the operator thread the stock to the edge trimmer.



The edge trimmer includes feed-in rolls, knife arbors and take-off rolls. It handles 16 to 24 gage material up to 49 in. wide.

Edges of trimmed stock are fed

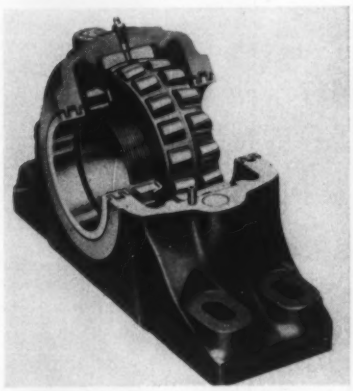
into a scrap chopper. It cuts strip up to 1½-in. wide into easily handled lengths.

The edge trimmed stock is fed into the press feed unit where it is flattened and surface measured. Lengths are held to ±1/32-in. by a measuring controller. *Write*: Dahlstrom Machine Works Inc., 4227 W. Belmont Ave., Chicago 41, Ill. *Phone*: Spring 7-3670

Pillow Block

Spher-Align is a line of pillow blocks which use spherical roller bearings.

Bearings are seated solidly on shafts by setscrews which are located parallel to the bore in the adapter nut. After the bearing is snugged up with the adapter nut, the adjustment is completed by turning the screws against the locking washer until bearing, adapter and shaft form an integral unit.

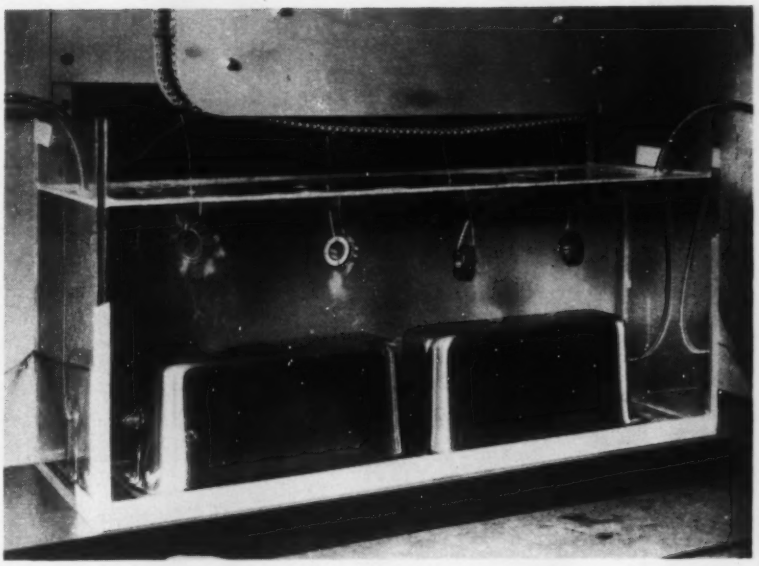


Dimensions of the pillow blocks are standardized. They fit shafts 2 7/16 to 8 in. in diameter. *Write*: Dodge Mfg. Corp., Mishawaka, Ind. *Phone*: 9-2421

Electronic Comparator

Model 130 B-9 can detect dimensional variations as small as 1 millionth of an inch.

The gaging spindle is mounted within the gage head on pantograph reed springs to provide frictionless motion transfer. This makes it sensitive to the smallest



Largest Immersion Equipment for Ultrasonic Cleaning by GU

Lowest cost conveyorized automatic ultrasonic cleaning is now practical with these new General Ultrasonics D-52 immersion Sonicells. Each unit provides a full 52 square inches of radiating area, operating at 20,000 cycles for maximum effectiveness.

The improved, customer-tested, D-52 has all-welded stainless steel construction and an exclusive internal design that results in great ruggedness, high efficiency and long life. Groups of D-52's provide efficient and economical operation in tanks and vats of unlimited volume in all the usual cleaning solutions.

These Sonicells are powered in large installations by exclusive GU motor generators for maximum dependability. Smaller installations are powered by our Model 700 and Model 400 electronic generators designed for continuous operations. All controls are simple and easy to operate.

The increased power of these new units has proved highly successful for the most difficult and largest cleaning operations to remove dirt, buffing, grinding and lapping compounds and also to replace hand cleaning operations on blind surfaces.

For further information or demonstration call or write.

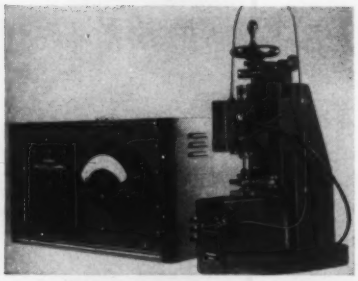
GU THE GENERAL ULTRASONICS COMPANY
67 Mulberry Street • Hartford 3, Conn.

THE ULTIMATE IN ULTRASONICS

variation in workpiece size and gives it exceptional repetitive accuracy.

Because of the small gaging pressure, thin-walled and highly polished parts can be measured without distorting or marking them.

Four magnifications range from 60,000 to 1 (0.000001-in. graduations) to 2000 to 1 (0.000030 in. graduations). *Write*: Federal Products Corp., 1144 Eddy St., Providence 1, R. I. *Phone*: Stuart 1-9300

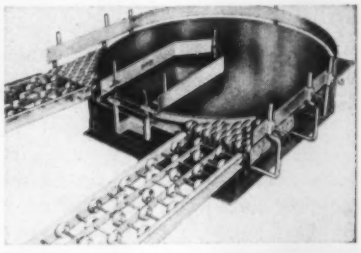


Powered Turn Table

Packages or loads are moved around 90 or 180 degree turns with this turntable. It can be used with powered or gravity conveyors.

Adjustable legs bring the top to the desired height. Ball-bearing wheel feeder sections assist in the smooth transfer of packages from conveyor to turntable and back to conveyor. These feeder sections may be placed at any two corners of the turntable frame.

Height of outer and inner guards can be adjusted. The turntable disc is 48 in. in diameter and is driven by a gearmotor at 25 rpm. *Write*: Samuel Olson Mfg. Co. Inc., 2418 Bloomingdale Ave., Chicago, Ill. *Phone*: Armitage 6-0900

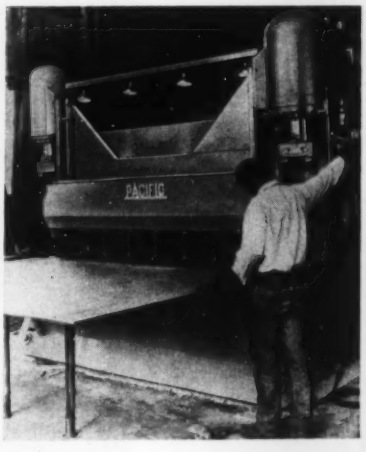


Hydraulic Shear

With its rake angle adjusted to ¾-in. per foot, this ½-in. machine cuts ¾-in. steel plates with the force usually required for ½-in. plates.

In handling ½-in. plates, the shear cuts in the same manner as fixed rake angle shears.

The rake angle is reduced to 3/32-in. per foot in cutting ¼-in.



7827-HC

PROTECT YOUR INVESTMENT WITH A Harco CATHODIC PROTECTION SYSTEM

Corrosion has an expensive appetite

If you can afford the bill . . . enjoy your guest. But remember . . . you've got this guest whether you can afford her or not. Check your profits . . . and see what this appetite is costing you regularly.

Electrolytic corrosion is the biggest single destroyer of buried or submerged metal structures and pipelines.

IT CAN BE STOPPED. That's where HARCO comes into the picture. It's our business to protect your investment. We are the specialists who can prevent and cure electrolytic corrosion . . . QUICKLY AND ECONOMICALLY. It is a fact . . . most cathodic protection systems pay for themselves in a matter of months . . . just through savings in normal maintenance and replacement costs.

HARCO regularly supplies a complete range of services. Whatever your needs . . . engineered systems, contract installations or materials . . . LOOK TO HARCO . . . FIRST IN THE FIELD OF CATHODIC PROTECTION!

Write today for catalog or call MOntrose 2-2080.

Harco

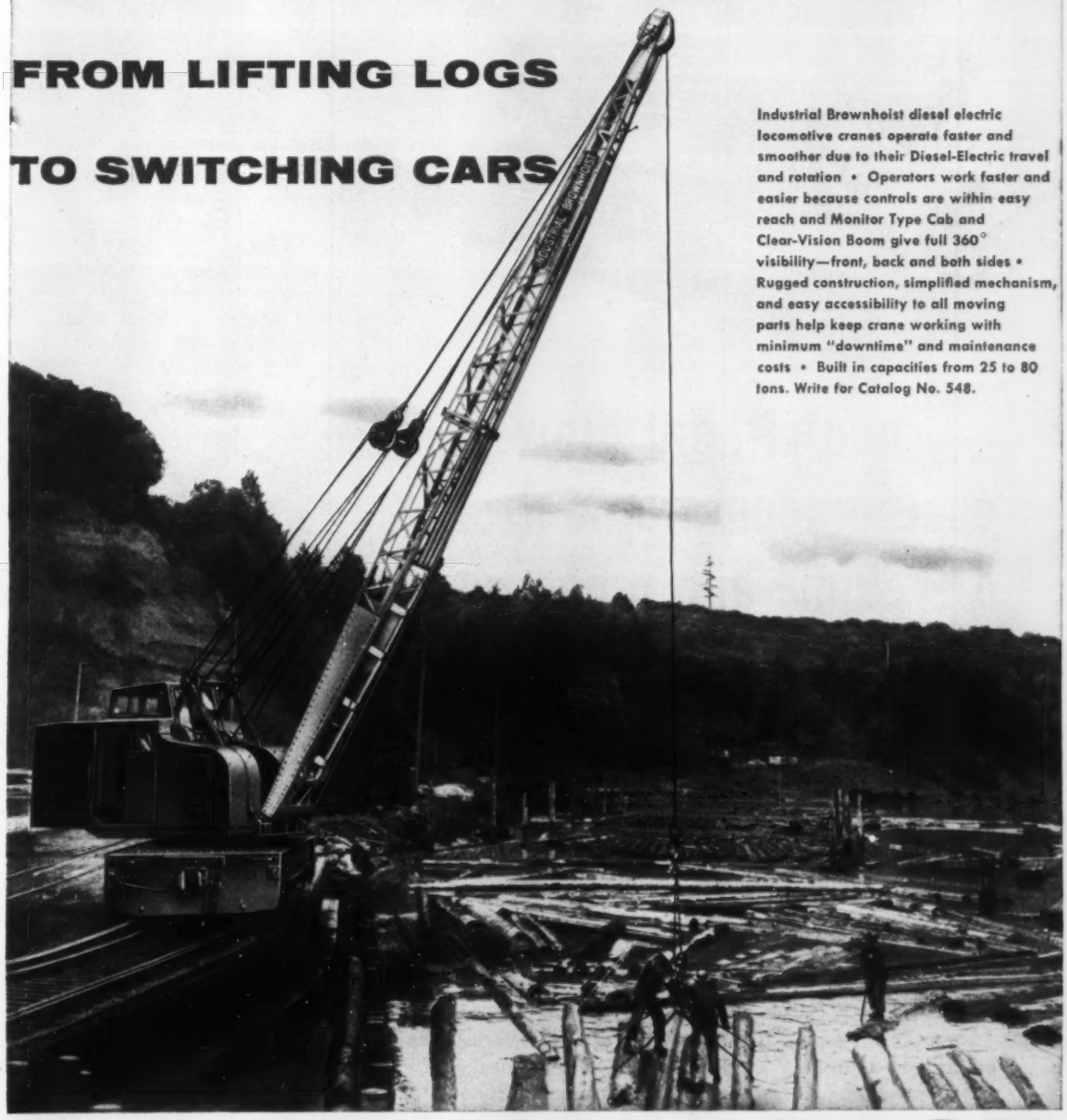
CATHODIC PROTECTION DIVISION

THE HARCO CORPORATION

16981 Broadway • Cleveland, Ohio

CLEVELAND • ALBANY • ATLANTA • CHICAGO • DAVENPORT
MINNEAPOLIS • NEW YORK • OKLAHOMA CITY • PITTSBURGH
DETROIT • HOUSTON • LOS ANGELES • LOUISVILLE • LYNCHBURG
PHILADELPHIA • SALT LAKE CITY • SEATTLE • ST. LOUIS • TORONTO, CANADA

WHY INDUSTRIAL BROWNHOIST LOCOMOTIVE CRANES SPEED UP JOBS FROM LIFTING LOGS TO SWITCHING CARS



Industrial Brownhoist diesel electric locomotive cranes operate faster and smoother due to their Diesel-Electric travel and rotation • Operators work faster and easier because controls are within easy reach and Monitor Type Cab and Clear-Vision Boom give full 360° visibility—front, back and both sides • Rugged construction, simplified mechanism, and easy accessibility to all moving parts help keep crane working with minimum "downtime" and maintenance costs • Built in capacities from 25 to 80 tons. Write for Catalog No. 548.

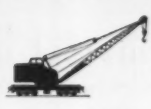
BROWNHOIST

CLAMSHELL BUCKET

250 TON WRECKING CRANE

COAL-ORE BRIDGE

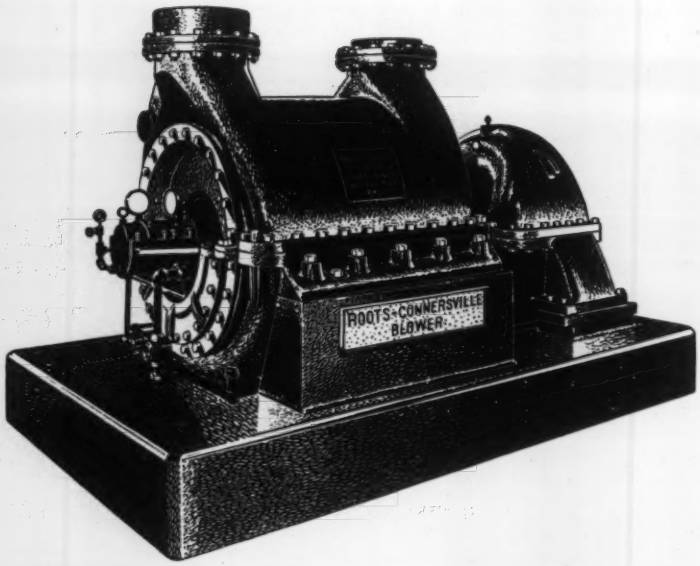
CAR DUMPER


LOCOMOTIVE CRANE

INDUSTRIAL BROWNHOIST CORPORATION, BAY CITY, MICHIGAN • DISTRICT OFFICES: New York, Philadelphia, Cleveland, Chicago, San Francisco, Montreal, Canada • AGENCIES: Detroit, Birmingham, Houston

SUBSIDIARY OF Penn-Texas

199



R-C centrifugal blowers assure accurate control of volume and pressure

At any speed, Roots-Connersville centrifugal blowers assure uniform delivery of air or gas without the use of receivers. In matching supply to changing demand, this inherent operating advantage simplifies accurate and instantaneous control of volume and pressure.

R-C centrifugals may be direct-connected to high speed electric motors or turbines. Operating speeds may be further raised with speed increasing gears. Occupying a minimum of space and perfectly balanced, with semi-rigid bearing supports to dampen vibration, they do not require special, costly foundations.

Liberal design of diffuser and return passages results in low velocities, normal efficiency even when build-up occurs and exceptionally quiet operation. Operating without internal lubrication, oil-free air is discharged, making it ideally suited for exacting process applications. For complete specification details, write for Bulletin 120-B-14.

Engineers—unusual career opportunities await you at Roots-Connersville. Address your resume to Professional Employment Manager.

ROOTS-CONNERSVILLE BLOWER

A DIVISION OF DRESSER INDUSTRIES, INC.

457 Hillside Ave., Connersville, Indiana. In Canada—629 Adelaide St., W., Toronto, Ont.

NEW PRODUCTS and equipment

steel. It will cut up to sixty 24-in. strips a minute.

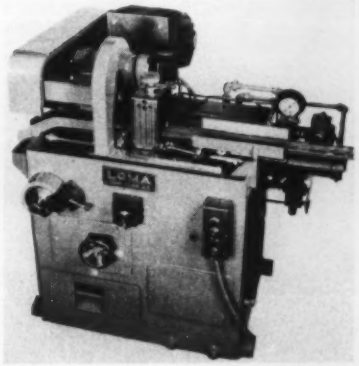
The shear cuts without noise or shock. *Write*: Pacific Industrial Mfg. Co., 848 49th Ave., Oakland 1, Calif. *Phone*: Andover 1-8303

Circular Saw

This cutoff saw operates at a peripheral speed of about 10,000 fpm. It handles lengths up to 12 in.; diameters up to 4 in.

A swinging arm oscillates the blade and allows as many as ten tubes or rods to be cut at a time.

The stock clamp holds the material on either side of the blade. Cuts are practically free of burrs.

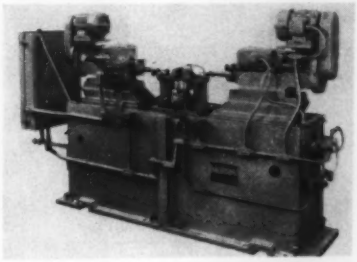


Oil-air mist lubrication can be applied. Loma Machine Mfg. Co. Inc., 114 E. 32nd St., New York 16, N. Y. *Phone*: Murray Hill 5-6410

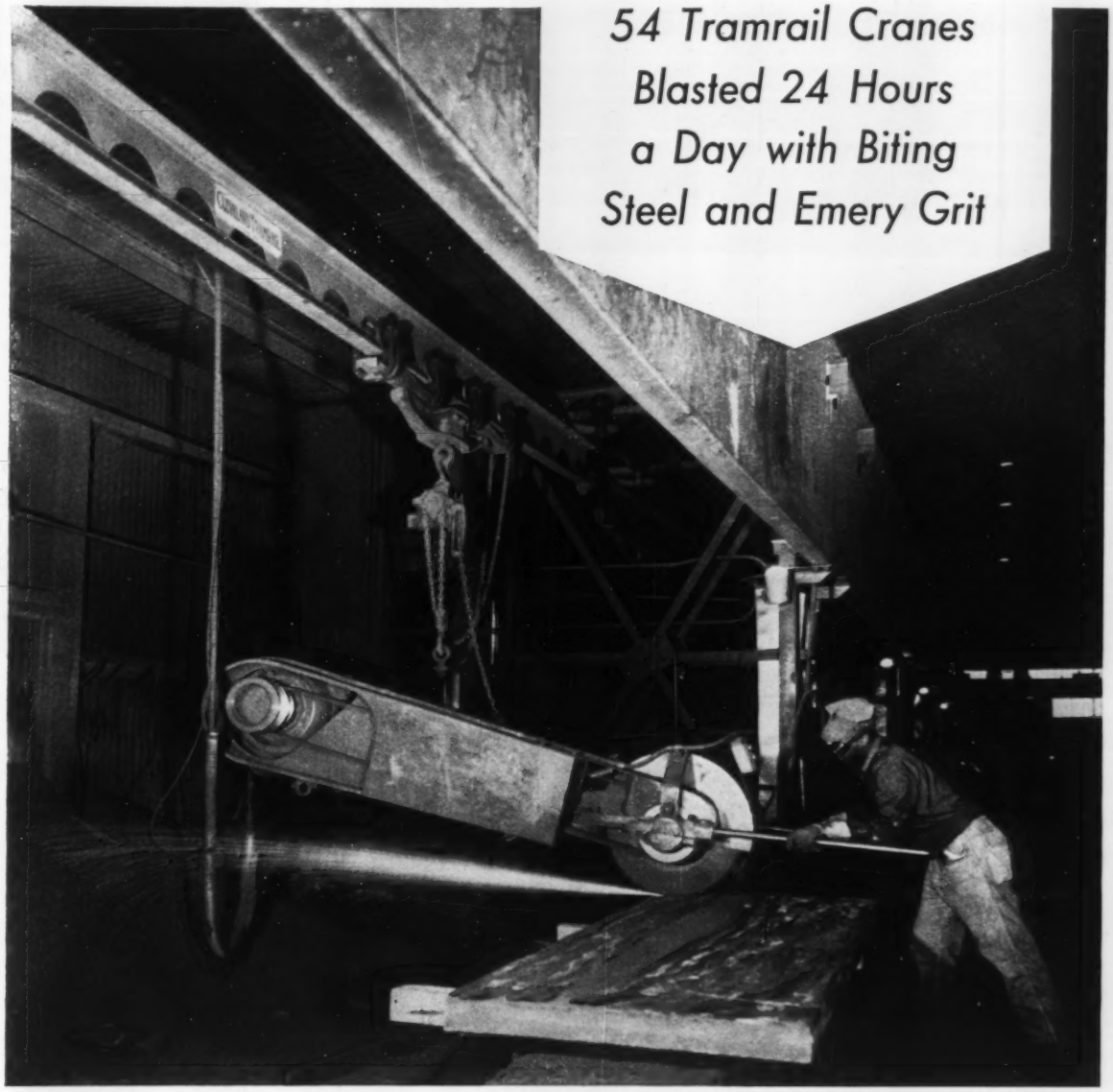
Two-Way Drill

Model 350-S is a machine that eliminates change-over time by automatically selecting the number of holes to be drilled. Range: Two, five or six equally spaced holes in a circular part.

Two drill units and an air-operated indexing fixture are inter-



Talk About *Tough* Working Conditions



54 Tramrail Cranes Blasted 24 Hours a Day with Biting Steel and Emery Grit

FOR years Cleveland Tramrail cranes have been handling swing grinders at a large Pennsylvania steel mill.

Despite the continuous storms of fine, penetrating, corrosive dust, the cranes operate with negligible maintenance.

The design and quality of Cleveland Tramrail equipment is of importance for every job, but on the tough ones like this is where these factors quickly prove their worth.

Cleveland Tramrail cranes are particularly well suited for swing grinder operation because of their free easy movement in any direction. This permits flat grinding over a wide area and avoids "dishing" of grinder wheel into the metal. Easy crane operation greatly reduces worker fatigue.

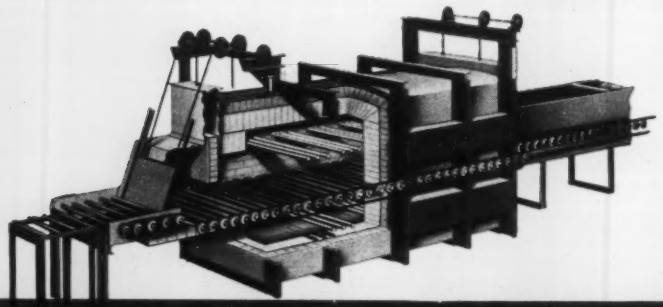
Write for free Engineering and Application Booklet No. 2008. Packed with valuable information.

CLEVELAND TRAMRAIL

Overhead Materials Handling Equipment

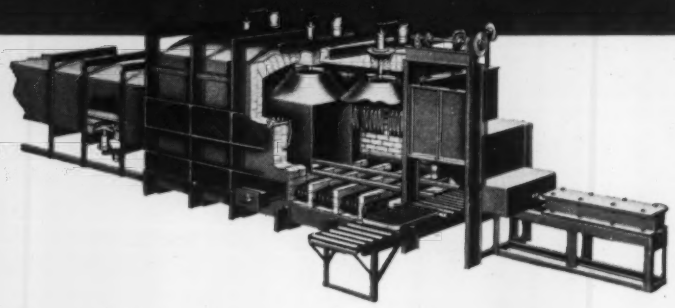
CLEVELAND TRAMRAIL DIVISION • The Cleveland Crane & Engineering Co. • 7821 East 290th St. • Wickliffe, Ohio

BLAZING THE HEAT TREAT TRAIL WITH HOLCROFT



LET'S TALK ABOUT

the economy of electric heating



Low initial cost—simplified maintenance—efficient use of heat.

All these represent good reasons why electric heat treat furnaces are important considerations. For example, gas-fired and electrically-heated furnaces are frequently competitive; in fact, when total installation cost figures are considered, electric furnaces often have the price advantage.

Upkeep is reasonable, too, because properly designed and installed electric heating elements are so easy to maintain and adjust. Elements are quickly removed for repairs.

Electric heat is more efficiently used for applications in the high temperature range. There is a considerably smaller heat loss in the use of electricity than gas—shrinking the price spread between the two. To be specific, a thorough study must be made of all factors: local power and fuel costs, production demands, quality control standards, etc., before any final decision can be made of the type of heating to be used. Holcroft will help you—a good place to start is to send for our new book **Holcroft and the Electric Furnace.** It's yours without obligation. 5858

HOLCROFT AND COMPANY

6545 EPWORTH BOULEVARD • DETROIT 10, MICHIGAN
PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

CHICAGO, ILL. • CLEVELAND, OHIO • HARTFORD, CONN. • HOUSTON, TEXAS • LOS ANGELES, CALIF. • PHILA., PA.
CANADA: Walker Metal Products, Ltd., Windsor, Ontario

NEW PRODUCTS and equipment

locked in a variety of automatic cycle combinations.

Drill sizes range up to 5/8-in. in diameter. *Write*: Morris Machine Tool Co., 933-36 Harriet St., Cincinnati 3, O. *Phone*: Parkway 1-5616

Automatic Soldering

Braze-O-Matic is a soldering machine which feeds solder automatically through magazines to preheated parts.

A timing mechanism operates and regulates the flame and the exact amount of solder. Heat is localized at the point of fabrication. *Write*: Castle Machines Inc., Erie, Pa. *Phone*: 5-5306

Asbestos Gaskets

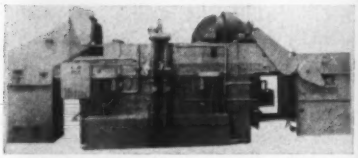
Asbestos fibers bound with styrene, nitrile or chloroprene type rubber will bend sharply without cracking.

The gasketing material is durable and easy to apply. It is available as roll goods, sheets or die-cut parts. *Write*: Industrial Division, Armstrong Cork Co., Lancaster, Pa. *Phone*: Express 7-5151

Cleaning Machine

Tote pans and the parts they contain are cleaned in this machine.

It receives filled tote pans, dumps the work into a drum-type washing section, then carries the



upside down pan through an integral conveyor type washing section above the drum section where work is processed.

Both work and tote pans are washed, rinsed and dried. Tote pans are moved to the discharge end of the machine ahead of the parts they contained. Cleaned parts are then loaded automatically into their original container. *Write*: Ransohoff Inc., N. Fifth St. & Ford Blvd., Hamilton, O. *Phone*: 3-5813

Boring Bars

The microadjustable boring tools combine multidiameter boring operations and even chamfering. They are used on turret lathes and provide precision finishes.

Throwaway inserts requiring no grinding are used. They can be adjusted to cut 0.001 in. on the diameter. *Write*: Wesson Co., 1220 Woodward Heights Blvd., Ferndale, Mich. *Phone*: Jordan 6-1500

Fork Truck

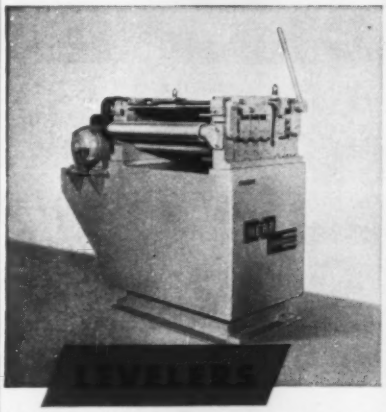
The Model E uses a multiple attachment to speed handling without the use of pallets.

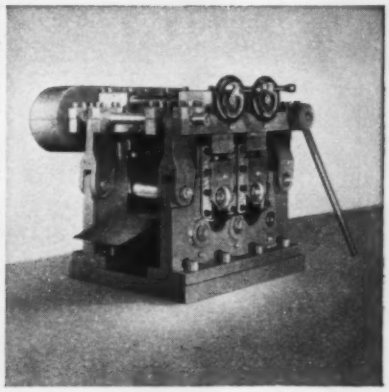
Multiple forks (six of them) pick up loads from a matching prong device. A pushoff plate is used to deposit loads.

A side-shifter attachment moves

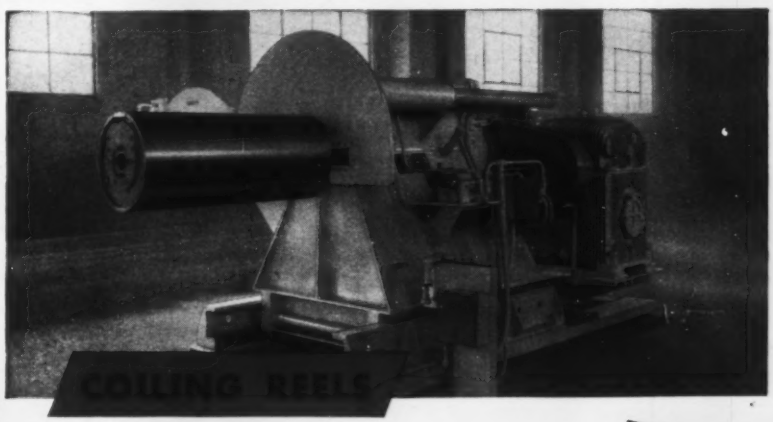
HERR EQUIPMENT

"Complete Processing and Handling Equipment . . . for any Ferrous or Non-Ferrous Material . . . That Starts — or Ends — as a Coil"





2-High and 4-High types. Driven and pull-through designs with quick release, for handling an extremely wide range of materials, widths and gauges. Rolls can be rubber covered if desired for easier adjustment and handling high finished materials.



Wide variety of types and sizes for coiling ferrous and non-ferrous strip. Fixed, adjustable or automatically aligning bases. Automatic oscillating level winding drive if desired. Link type contracting mandrels; manually or hydraulically operated. Furnished complete ready for use.

Write for fully descriptive Bulletin No. 561 today!

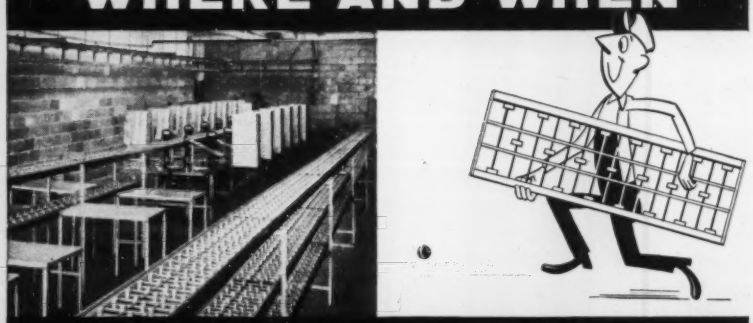
THE HERR EQUIPMENT CORPORATION

1250 VINE STREET • WARREN, OHIO

CLEVELAND, INDIANAPOLIS AND BERKELEY, CALIFORNIA

CONVEYORS

WHERE AND WHEN



YOU NEED THEM

BY BUSCHMAN

Exclusive design features make Buschman portable conveyors . . . wheel, roller and powered belt . . . quickest and easiest to move and put into operation. Durably constructed to withstand the roughest usage, these versatile conveyors have an unlimited range of application in production, warehousing, packing, shipping and receiving operations.

Pre-engineered standard components are combined into a conveyor system custom-tailored to your particular job. Then, whenever requirements change . . . wherever a new need arises . . . your system can be rearranged or relocated in minimum time . . at minimum expense.

Buschman portable conveyors are stocked at the factory and by leading distributors across the country. We'll gladly assist in surveying your plant to develop ideas which will cut costs, boost profits.

Write today for catalog and name of nearest representative.

PRODUCE MORE... FOR LESS — Buschman Conveyors — C-221-EWB

THE E. W. BUSCHMAN COMPANY
4496 Clifton Avenue, Cincinnati 32, Ohio

CONVEYOR SYSTEMS FOR ALL INDUSTRIES
ENGINEERED • MANUFACTURED • INSTALLED

NEW PRODUCTS and equipment

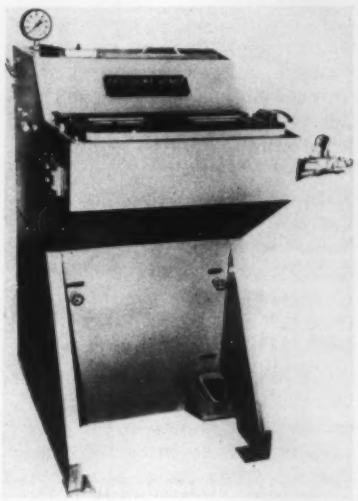
the forks horizontally to ease the placing and removal of goods from racks.

A remote control button is on the left side of the truck's mast. It is used by the operator to raise or lower forks to the proper working height when loading the truck manually.

Trucks have capacities of 1500 to 4000 lb and fork elevations of 102, 130 and 145 in. *Write*: Lewis-Shepard Products Inc., Watertown, Mass. *Phone*: Watertown 4-5400

Wet Blasting

Small machined parts are deburred by this machine. It also cleans stems on electronic tubes, satin finishes jewelry and strips wire ends.



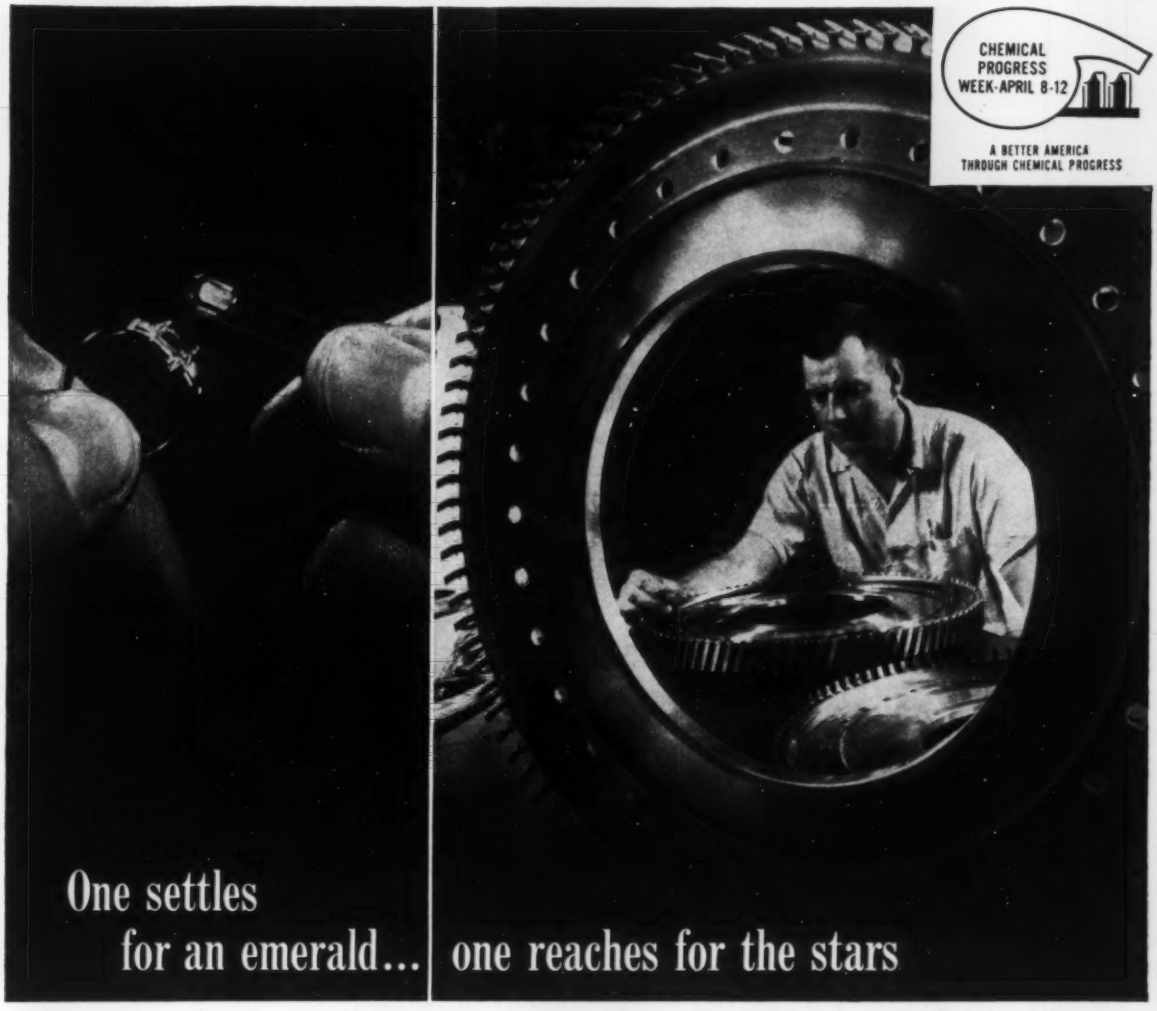
Blasting guns in the cabinet may be fixed, rotated or stroked. A foot switch controls blasting. *Write*: Cro-Plate Co. Inc., 747 Windsor St., Hartford, Conn. *Phone*: Jackson 7-8273

Fork Truck

The FTA-50 is an electric truck with a capacity of 5000 lb. Its turning radius is 77¾-in. Standard lift height is 120 in.

Maximum travel speed is 5.5 mph. Loaded lift speed is 24 fpm, and the lowering speed, with load, is 110 fpm.

Models with other capacities will



both are vapor degreased in Columbia-Southern Trichlorethylene

This 2¼ pwt. gold ring setting and these J-57 jet engine turbine assemblies of steel could hardly differ more. But there's a common denominator: vapor degreasing in Columbia-Southern Trichlorethylene prior to finishing. Like bathing a bird-of-paradise and a tiger in the same tub? Well, the "bath" proves just right for each.

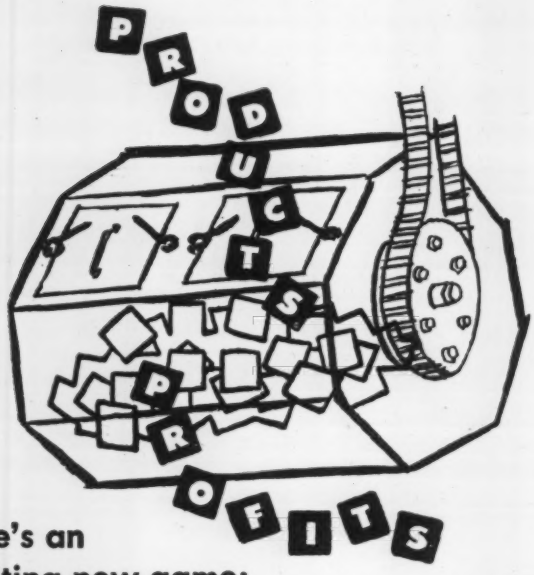
A product of original design and development—from pilot plant to *neutral* stabilizer—Columbia-Southern's Trichlorethylene is winning preference as the ideal vapor degreasing solvent for fast, efficient, low-cost cleaning of metal parts and assemblies. Huge plates and forms, tiny tubing and springs, finely machined surfaces and rougher, porous castings . . . all drain clean of contaminants in seconds. Painting and plating departments average far fewer rejects traced to incomplete cleaning.

This versatile solvent is made to extremely rigid standards of controlled quality by Columbia-Southern, one of the world's leading merchant producers of chlorine . . . an added assurance of dependable supply, incidentally. Its non-flammability, high vapor density and low boiling point mean added operating safety and purchasing economy. And the exclusive, *neutral* stability built into Columbia-Southern Trichlorethylene gives it chemical protection against decomposition under light, heat, oxygen, acids, moisture, and repeated distillations. It works equally well in batch and continuous units; on vapor, vapor slush, immersion, or vapor-spray-vapor cycles. Quenching oils remove as easily as light lubricants, even from deep draws.

Tank cars, tank trucks, drums . . . Columbia-Southern Trichlorethylene is available in the quantity most advantageous for your use. Get more information from your nearest Columbia-Southern sales office or your solvents distributor.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION
SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY
ONE GATEWAY CENTER · PITTSBURGH 22 · PENNSYLVANIA

DISTRICT OFFICES: Cincinnati • Charlotte Chicago • Cleveland • Boston • New York • St. Louis • Minneapolis • New Orleans • Dallas • Houston • Pittsburgh Philadelphia • San Francisco
IN CANADA: Standard Chemical Limited and its Commercial Chemicals Division



Here's an exciting new game:

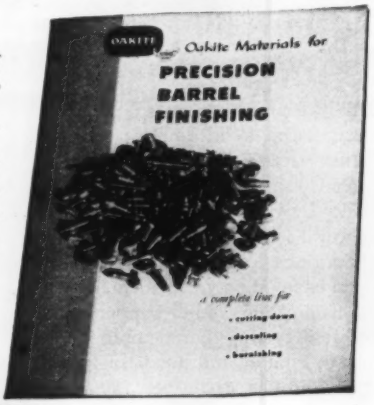
PUT your products in the barrel
TAKE your profits out

One of the greatest money-saving opportunities in metalworking lies in the use of barrels to finish parts by the hundreds in place of conventional methods that finish one part at a time.

Barrel finishing makes easy work of many tough jobs of grinding, deburring and buffing by wheel.

One Oakite customer changed to barrel methods to deburr curved stainless steel strips that are 14 inches long. The cost for deburring 20,000 strips was reduced from $3,000 to $125.00.

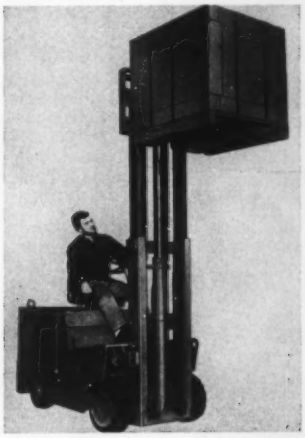
FREE For a copy of "*Precision Barrel Finishing*" —containing valuable information on cutting down, deburring, descaling, and burnishing—write to Oakite Products, Inc., 34E Rector Street, New York 6, N. Y.



SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS · METHODS · SERVICE
SCIENCE

Export Division
Cable Address: Oakite

Technical Service Representatives in Principal Cities of U.S. and Canada



be added to the line for normal and light duty applications. *Write*: Baker-Raulang Co., 1250 W. 80th St., Cleveland 2, O. *Phone*: Olympic 1-3000

Titanium Wire Cloth

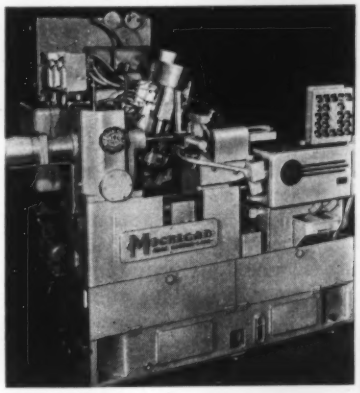
Corrosion resistant titanium cloth is used in filtering assemblies, catalysts, screens and other equipment.

Available mesh sizes include 30 x 30, 10 x 10 and many others which are available in stainless steels. *Write*: Cambridge Wire Cloth Co., Cambridge, Md. *Phone*: Cambridge 1033

Hobber Is Speedy

The Ultra-Speed Model 1433 is a horizontal, single spindle hobber that is easily adaptable to any degree of automation.

The machine will hob up to 12-pitch spur gears and helical gears. Maximum center distance from the



hob arbor to the work spindle is 3¼-in. Maximum crossfeed stroke of the hob is 4 in. Either right or left-hand helix angles up to 30 degrees can be hobbed.

Hobs speeds go up to 500 rpm. Either conventional or climb hobbing may be used with single, double or triple thread hobs.

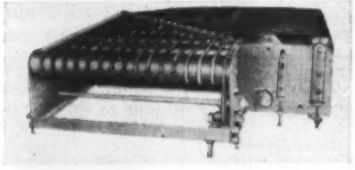
The hobber has a common subbase which enables machines to be set up in tandem or unlimited series with automatic through feeding and removal of parts. Gear washers and gear classifiers can be integrated into the machine units. Size control is automatic.

All machine services are self-contained in the subbase. *Write*: Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich. *Phone*: Twinbrook 1-3111

Conveyor Turn

Conveyors can make 90 degree turns with this unit. Its operation is based on a series of narrow belts which run in grooved pulleys.

The belts are banked to make constant contact with the material in motion. Positive belt guides prevent side shear as the material changes direction.



A slight differential in speed between the bank of belts produces a positive turning action. The design of the belts and their mounting eliminates belt friction reaction to turning. *Write*: Stewart-Glapat Corp., 1639 Moxahala Ave., Zanesville, O. *Phone*: Gladstone 2-5571

Flexible Coupling

L-693 is a zinc die-cast coupling for installation in original equipment. It consists of two bodies with jaws and a one-piece, spider-type cushion.

Coupling ratings range from 0.4 hp at 100 rpm to 4.6 hp at 3600

This is an actual photo of a surface prepared by polishing and etching a cross-section of a forging, to reveal the "grain flow." (x2)

A PICTURE OF ADVANTAGES YOU CAN GET ONLY FROM FORGINGS

In the picture above you see the grain flow in a forging.

This picture demonstrates two things. First, the metal is dense and free from porosity. The impact or pressure of forging helps make it so. Such density is important when parts must have machined surfaces, when they must provide reliable strength and safety, and when they must be tight against leakage of liquids or gases. This quality reduces rejects and saves money. It contributes to safety and saves lives.

Second, notice how grain flow lines follow the shape of the part. This improves impact resistance and fatigue strength of the part. In closed-die forging, these flow lines can be positioned, to give maximum properties where they are needed. As a result, forged parts can be lighter, safer, stronger, and frequently less costly.

Thus this picture shows you why forged metal is *metal you can trust*. You can trust forgings for performance, and to save money. Find out how forgings can improve your products, your costs. Consult a *Forging Engineer*, and send for the booklets offered below.

closed-die **forgings** for metal you can trust

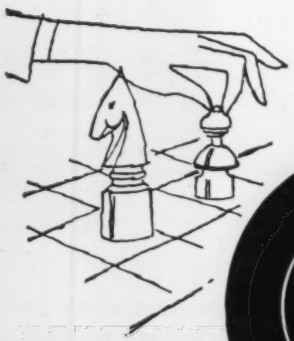
DROP FORGING ASSOCIATION

Dept. S, 419 S. Walnut St. • Lansing, Michigan

Symbolic emblem of the Drop Forging Association

Attach this advertisement signature to your letterhead and mail to Drop Forging Association to receive booklet "What is a Forging?" ☐ or "Management Guide to Use of Forgings". ☐ Check title or titles desired.

Flexible, fast and safe, Coles mobile cranes can do more jobs better for less



Coles works closer to stacks for accurate spotting, maximum SELECTIVITY

COLES CRANES

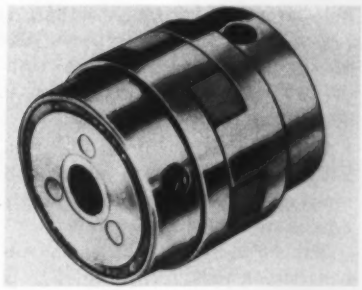
JOLIET 7, ILLINOIS

Write for booklet "101 COST-CUTTING WAYS"

Photo courtesy of International Harvester Company's Tractor Works - Chicago, Illinois

Now, available L.P.G.- diesel- or gasoline-electric powered in capacities from 2 to 15 tons. Available on long term lease arrangement, too.

NEW PRODUCTS and equipment



rpm. The unit is 2½-in. long and 2⅛-in. in diameter.

Bores are 5/16 to 1 in. *Write*: Lovejoy Flexible Coupling Co., 4975 W. Lake St., Chicago 44, Ill. *Phone*: Estebrook 9-3010

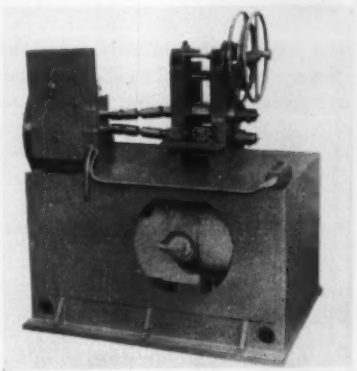
Pipe Bender

The One Shot is a portable tool for pipe 8 in. and larger. Angles up to 90 degrees can be bent in one setting.

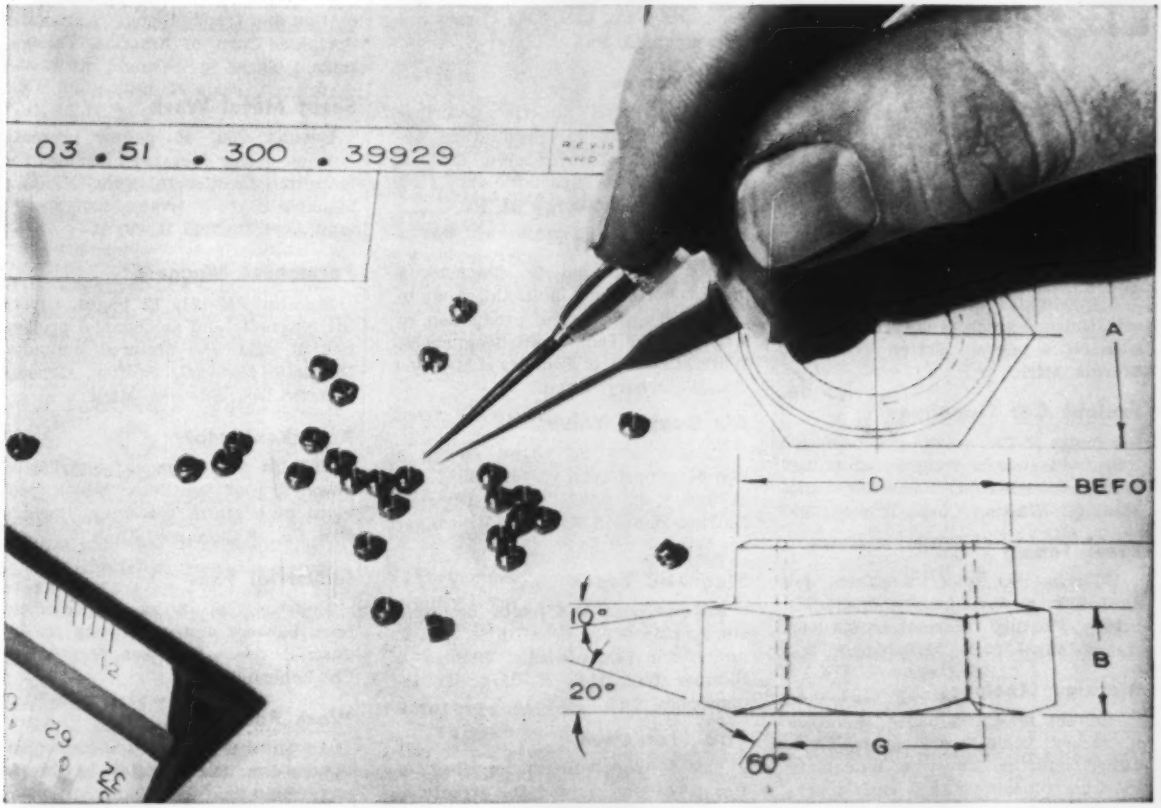
The unit is easy to assemble and take down. The frame can be folded together onto the top of the hydraulic ram. *Write*: Tal Bending Equipment Inc., Milwaukee 2, Wis. *Phone*: Broadway 1-8676

Rolling Mill

Model 042 production rolls special wire sections. The mill can roll nonferrous wire at speeds up to 750 fpm with a maximum separating force of 40,000 to 60,000 lb.



The 2-high mill has a pinion gear drive. The roll diameter is 4 in. and face width is 3 in. *Write*: Fenn Mfg. Co., Newington, Conn. *Phone*: Mohawk 6-2471



FLEXLOC MICROSIZE locknuts meet designers' needs for tiny precision nuts that retain strength and holding power in the smallest assemblies—servomechanisms, electronic and electrical equipment, all miniature devices.

New FLEXLOC Microsize Locknuts

Now available in Alloy Steel, Stainless Steel, Brass and Aluminum for lighter, more compact designs

SIZE	Across Flats		Hex. Height	Across Corners	Height
	MAX.	MIN.	REF.	MIN.	REF.
0-80 NF-3B	.111	.107	.046	.121	.075
1-64 NC-3B	.127	.123	.056	.140	.090
1-72 NF-3B	.127	.123	.056	.140	.090
2-56 NC-3B	.158	.153	.067	.176	.105
2-64 NF-3B	.158	.153	.067	.176	.105
3-48 NC-3B	.190	.183	.071	.210	.120
3-56 NF-3B	.190	.183	.071	.210	.120
4-40 NC-3B	.190	.183	.071	.210	.120
4-48 NF-3B	.190	.183	.071	.210	.120

SPECIFICATIONS: Available in brass (plain or cadmium plated) and aluminum (plain or chemically treated), for temperatures to 250°F; in alloy steel (plain or cadmium plated) and 18-8 stainless steel (silver plated) for temperatures to 550°F.

New FLEXLOC Microsize locknuts are smaller and lighter than regular FLEXLOCS of the same nominal diameter. Wrenches of smaller size are used to install them. Mating joints or flanges can be designed smaller—with no loss in strength or convenience of assembly.

Microsize FLEXLOCS have all the advantages of larger FLEXLOCS. One-piece, all-metal construction—nothing to put together, come apart, lose or forget. Use them as lock or stop nuts—they stay put anywhere on a threaded member as soon as the locking threads are fully engaged. Uniform locking torques insure accurate preloading. There are no nonmetallic inserts to pop out or deteriorate. Moisture, dryness, oil won't affect these Microsize FLEXLOCS. Just screw them on. They lock and stay locked. Vibration won't shake them loose.

For complete information on Microsize FLEXLOCS, consult your authorized SPS distributor. Or write STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

STANDARD PRESSED STEEL CO.

FLEXLOC® LOCKNUT DIVISION SPS

JENKINTOWN PENNSYLVANIA

NEW literature

Write directly to the company for a copy

Welding Electrodes

Hard-facing and manganese electrodes and their uses are covered in this 20-page bulletin. Sight Feed Generator Co., West Alexandria, O.

Taper Lock Feeder

A master feeder for hot rolled and cold finished stock is covered in bulletin 50, 4 pages. Sutton Tool Co., Sturgis, Mich.

Freight Car Handling

Bulletin T-124, a 4-page case history, tells how a freight car puller improved switching, spotting and hauling. Whiting Corp., Harvey, Ill.

Steel Tubing

Bulletin P.O. 2656, 4 pages, describes the advantages of welded steel tubing. Product Information Service, Armco Steel Corp., Middletown, O.

Marking Machines

Bulletin 146-C9, 4 pages, describes a rotary table marking machine. Other bulletins cover a nameplate marking machine and a shell marking and knurling machine. Jas. H. Matthews & Co. Inc., 3942 Forbes St., Pittsburgh 13, Pa.

Float Valves

This 16-page bulletin describes cushioned float valves used to accurately control water levels. Golden-Anderson Valve Specialty Co., 1252 Ridge Ave., Pittsburgh 33, Pa.

Redraw Presses

This 12-page bulletin describes a line of horizontal, multistation automatic presses for the production of straight and shouldered deep shells. Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

Air Control Valves

Catalog 105, 26 pages, covers a line of poppet-type valves for ¼, ⅜, ½ and ¾-in. pipe. Nopak Division, Galland-Henning Mfg. Co., Milwaukee 46, Wis.

Magnetic Tapes

Bulletin DMF-4, 4 pages, describes silicon iron tapes made in 1, 2, 4, 5, and 7-mil thicknesses. Thomas & Skinner Inc., 1183 E. 23rd St., Indianapolis, Ind.

Fire Protection

This 10-page bulletin describes the fire protection needed for structures and equipment used with power generation and transmission. Automatic Sprinkler Corp. of America, Youngstown 1, O.

Sheet Metal Work

Booklet 203, 40 pages, presents data on power operated machines for plate and sheet metal work. Niagara Machine & Tool Works, 683 Northland Ave., Buffalo 11, N. Y.

Permanent Magnets

Bulletin PM-121, 12 pages, covers the magnetic and mechanical properties of cast and sintered magnets. Magnetic Materials Section, General Electric Co., Edmore, Mich.

Roof Ventilator

Bulletin 550, 4 pages, describes a powered roof ventilator which provides high static pressures. Clarage Fan Co., Kalamazoo, Mich.

Industrial Fans

Bulletin 502, 8 pages, describes fans, blowers and exhausters for industrial use. Robinson Ventilating Co., Zelienople, Pa.

Work Positioners

Advantages of self-leveling positioners are demonstrated in this 6-page bulletin. Lowerator Division,

"Buff"de Gook Comes Clean
The plate always streaks and bubbles in this deep groove. We're not getting all the buffing compound out, even tho we dumped the electrocleaner just yesterday
And only 5 ounces a gallon at 160°? We'll give it a whirl . . . Say, Al, how'd you learn so much about plating?
"To work for Pennsalt, I had to learn not only your problems but the problems of the drawing shop, the paint shop, the porcelain enamel boys, the aluminum fabricators — everybody who uses chemicals on metal."

NEW LITERATURE

American Machine & Foundry Co., AMF Bldg., 261 Madison Ave., New York 16, N. Y.

Fuel Injection

This 12-page bulletin describes a fuel injection system for diesel engines. Cummins Engine Co. Inc., Columbus, Ind.

Drill Presses

This 12-page bulletin covers a line of floor and bench, single and multiple spindle drill presses. Delta Power Tool Division, Rockwell Mfg. Co., 470 N. Lexington Ave., Pittsburgh 8, Pa.

Steel Catalog

This 232-page product and warehouse catalog describes over 700 products available from stock and 16 types of special purpose steels available in 16,000 grades and sizes. Engineering Service Department, Crucible Steel Co. of America, Box 1558, Pittsburgh 30, Pa.

Magnetic Drives

Design, drive features, operating and performance curves, ratings and dimensions of 1 to 15-hp drives are covered in this 6-page bulletin. Whitney Chain Co., 237 Hamilton St., Hartford 2, Conn.

Cutters

This 36-page catalog covers end mills, keyseat cutters, drills, countersinks, center reamers and special tools. Fastcut Tool Co., 7405 E. Davison Ave., Detroit 12, Mich.

Speed Reducers

Bulletin 1105, 24 pages, gives information on concentric and right-angle speed reducers for applications up to 140 hp. Department 255, Falk Corp., 3001 W. Canal St., Milwaukee 1, Wis.

Gear Spraying

Equipment for spraying gears with lubricant is described in an 8-page bulletin. Alemite Division, Stewart-Warner Corp., 1826 Diversey Parkway, Chicago 14, Ill.

Rotary Pumps

Bulletin 957, 12 pages, covers rotary pumps and hydraulic pump motors. Geo. D. Roper Corp., Rockford, Ill.

Perforated Metals

This 4-page bulletin illustrates patterns of perforated metals for ornamental and industrial uses. Advertising Department, Colorado Fuel & Iron Corp., 575 Madison Ave., New York 22, N. Y.

Shutoff Valve

Bulletin E-39, 4 pages, describes a burner valve used in hot blast stove installations. Engineering & Construction Division, Koppers Co. Inc., 1450 Koppers Bldg., Pittsburgh 19, Pa.

Two Diameter Drilling

This 8-page bulletin presents the advantages of subland drills. Mohawk Tools Inc., 910 E. Main St., Montpelier, O.

Abrasive Belts

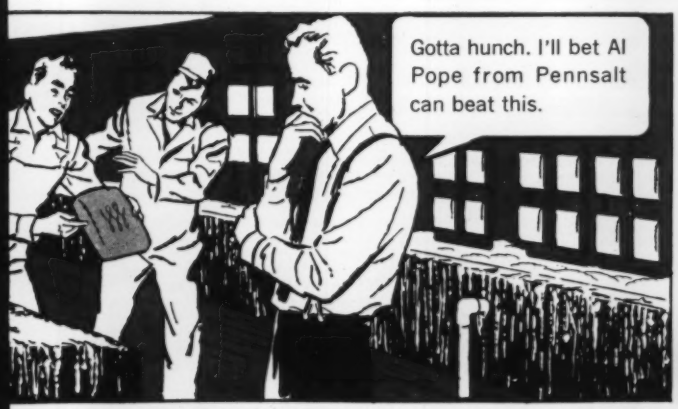
This 8-page bulletin describes an engineering service which predicts the performance of abrasive belts on any metal removal operation except snagging. Coated Abrasives Division, Carborundum Co., Niagara Falls, N. Y.

Induction Heating

The history and uses of induction heating are described in this 18-page bulletin. Ajax Electrothermic Corp., Box 877, Trenton 5, N. J.

Pushbuttons

Bulletin GEA-6544, 8 pages, covers standard and heavy duty pushbutton stations. General Electric Co., Schenectady 5, N. Y.



I think we can get these shells perfectly clean . . . and save you money besides, by letting you run your tanks cooler. I'll check our Whitemarsh lab.
OK. but hurry, Al.

Two Weeks Later...
Al, your service is as good as your products. We weren't getting anywhere with that buffing gook till I let Pennsalt work on it.

Remember—nobody knows more about metal processing chemistry than Pennsalt. Even if your trouble may not seem to involve your Pennsalt salesman, call him in anyway. Or write

Pennsalt Chemicals

Metal Processing Dept. 428
Pennsalt Chemicals
3 Penn Center
Phila. 2, Pa.

Please send me information on Pennsalt
☐ metal cleaners ☐ phosphate coatings
☐ cold-working lubricants.

Name_____
Company_____
Street_____
City_____ Zone____ State_____

CMP

RESTRICTED SPECIFICATION COLD ROLLED STRIP STEEL

for Spring Steel Requirements such as these . . .

FORMED PARTS FOR HEAT TREATMENT

SIZE	.8 x .038
ANALYSIS	1050
FINISH	Bright
HARDNESS	Rockwell B-78 Max.
THICKNESS TOLERANCE	± .0003 incl. crown
WIDTH TOLERANCE	± .005
MICROSTRUCTURE	Uniform spheroids
COIL SIZE	16" I.D. coils large as possible
PACKAGING	On skids — shrouded

FLAT PARTS FOR HIGH STRENGTH WITHOUT HEAT TREATMENT

SIZE	10 x .020
ANALYSIS	1075
FINISH	Bright
HARDNESS	Rockwell C-30 Min.
THICKNESS TOLERANCE	± .001 incl. crown
WIDTH TOLERANCE	± .005
MICROSTRUCTURE	Small-fine carbides
COIL SIZE	16" — I.D. Max. coil wt. 1000#
PACKAGING	On skids — shrouded

Knowing exactly what you require for most efficient fabrication and most effective product performance, CMP can set up and consistently meet restricted specifications to match your most exacting demands. Often production operations can be greatly simplified or even eliminated; in most instances end-product and/or assembly costs can be reduced and quite frequently, product quality improved.

We would welcome an opportunity to explore with you the possibilities of CMP Restricted Specifications applied to your strip steel requirements.

THE 3 IN 1 SOURCE FOR YOUR COLD ROLLED STRIP STEEL

Now there are three CMP plants with facilities for production of "Restricted Specification" cold rolled strip. Strategic locations at Youngstown, Indianapolis and Los Angeles, provide the security of 3 sources of supply plus the close working relationship which these local production centers make possible.

SIZE	14 x .040
ANALYSIS	1095
FINISH	Bright
HARDNESS	95 to 105 Rockwell B suitable for blanking
THICKNESS TOLERANCE	± .0005 incl. crown
WIDTH TOLERANCE	± .005
MICROSTRUCTURE	Uniform medium size spheroids
COIL SIZE	16" — I.D. Max. coil wt. 800#
PACKAGING	On skids — shrouded

THE COLD METAL PRODUCTS CO.
GENERAL OFFICES: YOUNGSTOWN 1, OHIO
PLANTS: YOUNGSTOWN, INDIANAPOLIS AND LOS ANGELES
SALES OFFICES: NEW YORK - CLEVELAND - DETROIT - INDIANAPOLIS
CHICAGO - LOS ANGELES - SAN FRANCISCO

Market Outlook

THE steel production rate is easing downward, but there are signs it will not dip far.

- A Pittsburgh producer of hot and cold-rolled carbon steel sheets finds it has more tons of these products booked now for June delivery than it had a month ago for May delivery.
- Charles M. White, chairman, Republic Steel Corp., Cleveland, reports his company booked more steel tonnage in the first 25 days of March than it did in the comparable period of last year.
- There are enough orders booked to keep the durable goods industry (user of steel and other metals) running at current high rates through July.

EASY TO GET— While good demand through June is indicated, steel (except for a few products) will be easy to get. Supply has caught up with demand. The reasons: 1. Consumers see no need to build large inventories (in fact, they have been cutting them down). 2. The steel industry has expanded its capacity.

Steel inventory reduction has about run its course. From here on, demand should be about in line with consumption, except for a little flurry of buying to beat midyear price increases. So the effect will be a bolstering of steel production.

SPEEDY DELIVERY— Most steel consumers are enjoying quick deliveries of steel. As a consequence, they are in no hurry to order. For instance, U.S. Steel Corp.'s hot-rolled bar division has 85 per cent of its capacity booked for April delivery, but 45 per cent of the orders came in after Mar. 5—nominal deadline for April.

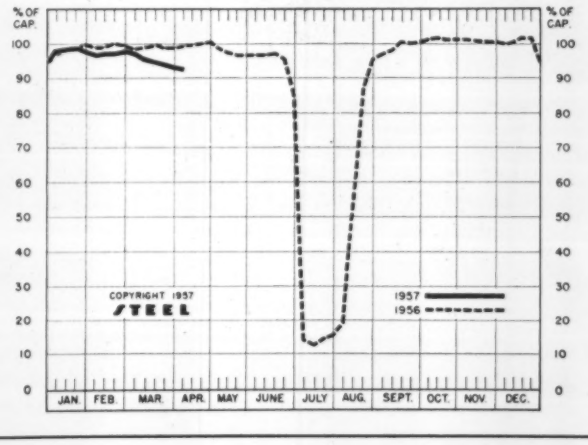
Products that have continued in tight supply—heavy plates and structural shapes—are showing signs of easing, but you still have to allow considerable lead time for delivery. Standard structurals have eased more than wide flange structurals. Oil country tubular goods were booked up quickly for the entire second quarter.

SLOWER— The second quarter began with the steel industry at its slowest pace of this year, but it still was above 90 per cent of capacity. In the week ended Apr. 7, the industry produced steel for ingots and castings at 92.5 per cent of capacity. This was a decline of 0.5 point from the preceding week.

EXPORTS HELP— Helping sustain the operating rate is the foreign market. Some steel producers are exporting as much of their excess steel as possible. Most of the export tonnage is semifinished—blooms, billets, slabs and tube rounds, although some hot-rolled sheets are going out, too.

NEAR BOTTOM— The easing in steel production continues to push down the price of steel scrap, a raw material for the steel industry. In the week ended Apr. 3, STEEL's price composite on steelmaking scrap was $45 a gross ton, a decline of $2.67 from that of the preceding week. A year ago, the composite was $54.17. There are indications scrap prices have about reached their depth. Last year, the composite didn't go below $45.50, and that was during the steelworkers' strike.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

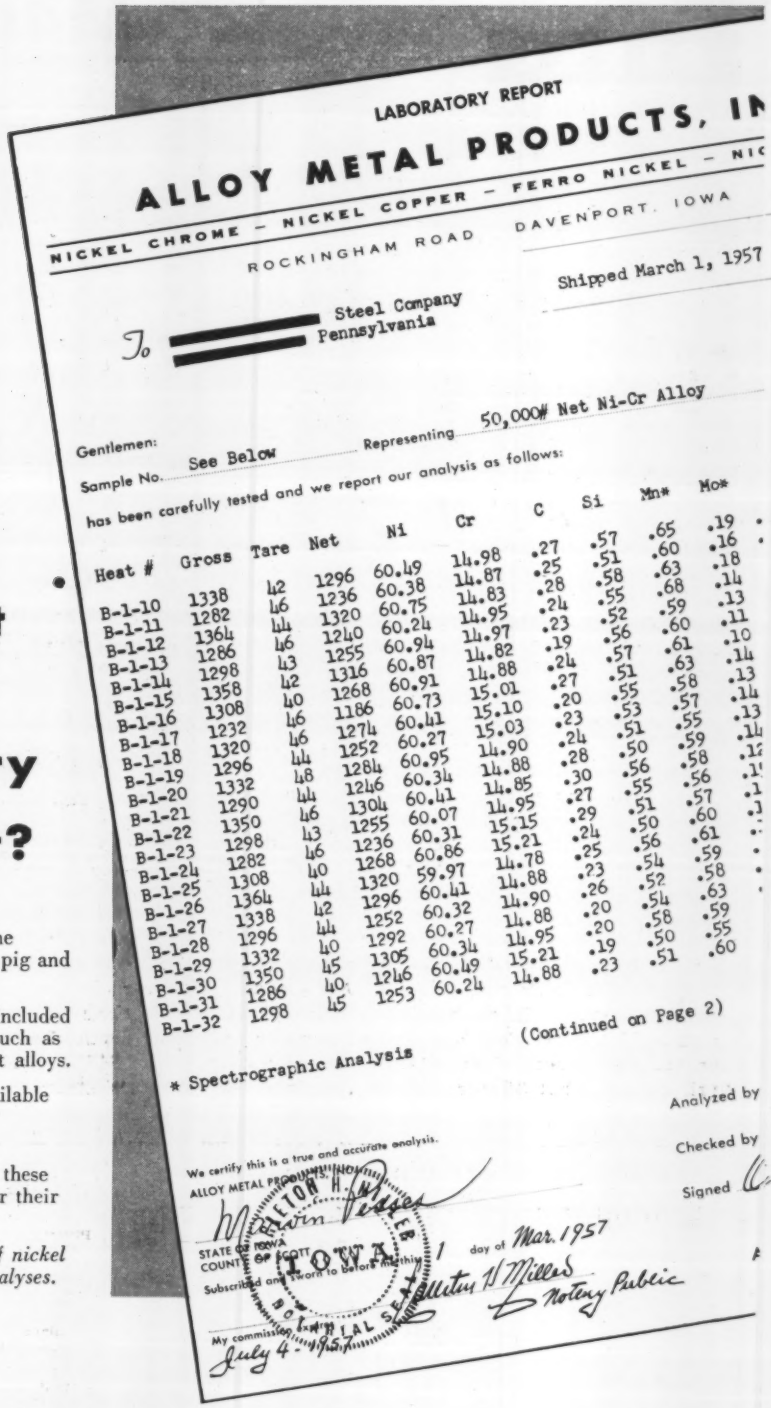
	Week Ended Apr. 7	Change	Same Week 1956	Same Week 1955
Pittsburgh	94	+ 0.5*	100	96.5
Chicago	90.5	+ 2*	100.5	98.5
Mid-Atlantic	95	0	98	95
Youngstown	89	— 2	103	96
Wheeling	90	+ 10.5	96.5	92.5
Cleveland	91	— 3*	93.5	102.5
Buffalo	98	— 2	105	104.5
Birmingham	97	— 2	93	87.5
New England	65	0	85	82
Cincinnati	69	— 3	89	91.5
St. Louis	101	+ 2	95	95
Detroit	95	— 1	95.5	92
Western	104	— 2	104	97
National Rate	92.5	— 0.5	99.5	95

INGOT PRODUCTION‡

	Week Ended Apr. 7	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	145.9	147.2	150.1	149.8
NET TONS (In thousands)	2,344†	2,364	2,411	2,406

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,359,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.

Metalworking Outlook—p. 53 Technical Outlook—p. 91



LABORATORY REPORT

ALLOY METAL PRODUCTS, IN

NICKEL CHROME — NICKEL COPPER — FERRO NICKEL — NIC

ROCKINGHAM ROAD DAVENPORT, IOWA

Shipped March 1, 1957

To Steel Company
Pennsylvania

Gentlemen:

Sample No. See Below Representing 50,000# Net Ni-Cr Alloy

has been carefully tested and we report our analysis as follows:

Heat #	Gross	Tare	Net	Ni	Cr	C	Si	Mn*	Mo*
B-1-10	1338	42	1296	60.49	14.98	.27	.57	.65	.19
B-1-11	1282	46	1236	60.38	14.87	.25	.51	.60	.16
B-1-12	1364	44	1320	60.75	14.83	.28	.58	.63	.18
B-1-13	1286	46	1240	60.24	14.95	.24	.55	.68	.14
B-1-14	1298	43	1255	60.94	14.97	.23	.52	.59	.13
B-1-15	1358	42	1316	60.87	14.82	.19	.56	.60	.11
B-1-16	1308	40	1268	60.91	14.88	.24	.57	.61	.10
B-1-17	1232	46	1186	60.73	15.01	.27	.51	.63	.14
B-1-18	1320	46	1274	60.41	15.10	.20	.55	.58	.13
B-1-19	1296	44	1252	60.27	15.03	.23	.53	.57	.14
B-1-20	1332	48	1284	60.95	14.90	.24	.51	.55	.13
B-1-21	1290	44	1246	60.34	14.88	.28	.50	.59	.14
B-1-22	1350	46	1304	60.41	14.85	.30	.56	.58	.12
B-1-23	1298	43	1255	60.07	14.95	.27	.55	.56	.1
B-1-24	1282	46	1236	60.31	15.15	.29	.51	.57	.1
B-1-25	1308	40	1268	60.86	15.21	.24	.50	.60	.1
B-1-26	1364	44	1320	59.97	14.78	.25	.56	.61	.
B-1-27	1338	42	1296	60.41	14.88	.23	.54	.59	.
B-1-28	1296	44	1252	60.32	14.90	.26	.52	.58	.
B-1-29	1332	40	1292	60.27	14.88	.20	.54	.63	.
B-1-30	1350	45	1305	60.34	14.95	.20	.58	.59	
B-1-31	1286	40	1246	60.49	15.21	.19	.50	.55	
B-1-32	1298	45	1253	60.24	14.88	.23	.51	.60	

(Continued on Page 2)

* Spectrographic Analysis

Analyzed by

Checked by

Signed

We certify this is a true and accurate analysis.

ALLOY METAL PRODUCTS, INC.

Melvin Pesses

STATE OF IOWA
COUNTY OF SCOTT

Subscribed and sworn to before me this 1 day of Mar. 1957

Milton H. Miller
Notary Public

My commission expires July 4 - 1957

PHILETON H. MILLER
NOTARIAL SEAL
IOWA

Our business is staked on it

. . . will you try one heat on it?

THIS IS OUR LABORATORY REPORT on one customer's order for Alloymet nickel base pig and shot* for stainless steel production.

It gives a complete analysis of *each heat* included in the total order. A notarized report such as this travels with every order of Alloymet alloys.

These alloys of certified analysis are available at approximately 5% over the cost of nickel alloy scrap.

Contact us now — discover why use of these alloying agents more than compensates for their slight premium in cost.

**Alloymet available in a complete range of nickel chrome, nickel iron and nickel copper analyses.*

ALLOY METAL PRODUCTS, Inc.
PHONE 6-2561 • TELETYPE DV 588

(FORMERLY A DIVISION OF **ALTER COMPANY**)
ROCKINGHAM ROAD
DAVENPORT, IOWA

World's largest producer of secondary nickel alloys of certified analysis

Wheeling: Ahead of Pack

This West Virginia steel company keeps its operating rate above national average. Ohio river "Main street" helps, but integration, flexibility and independence are big reasons

VERSATILITY, closely knit operations and self-sufficiency: Those are three reasons executives of Wheeling Steel Corp., Wheeling, W. Va., cite for their ability to keep their company's steelmaking rate consistently above the national average.

In 1954, Wheeling's operating rate was 74.6 per cent of capacity while the national average slumped to 71 per cent. The next year the firm's rate shot up to 96.6 per cent, 3.6 points above the national average. Even last year when the steelworkers' strike pushed the industry's average for the year down to 89.8 per cent of capacity, Wheeling posted a 93.7 per cent average. At the end of March, Wheeling's production continued at 100 per cent except for a ten-day curtailment due to installation of a hot-scarfing unit.

Closely Knit—"Our plant sites are close enough to each other that we can visit them all in one day," points out G. P. Hansen, assistant vice president, operations. "We can keep close control over operations and make necessary changes quickly. Our several installations are actually one 25-mile-long plant with the Ohio river as its main street."

Steelmaking is centered at Steubenville, O., but the finishing mills are all less than 30 miles downstream from that city.

Self-Sufficient — Wheeling Steel is almost independent in its supply of most raw materials. It purchases less than 2 per cent of its scrap on the open market, thus avoiding ups and downs characteristic of that material. In addition, the company avoids the danger of tramp elements being present in purchased scrap. Most of Wheeling's coal is obtained from mines near Pittsburgh and transported down the Ohio river in the company's own barges.

Versatile — Wheeling credits much of its consistently high operating rate to the fact that it depends on no single fabricator for a predominant proportion of its sales. Last year, 29 per cent of its tonnage was sold through warehouses. Most important individual customers were producers of containers and the construction industry, but neither took more than 20 per cent of the company's output.

"We don't want to be dependent on the ups and downs of any one industry or on seasonal conditions," say company sales managers. "We can change our production plans instantly, depending on which markets show the greatest promise. We don't have to set aside steel for a consumer whose needs are declining."

As an example, Wheeling sales officials report that they have expanded their strip mill plate supply rapidly in the past year to meet growing demand from railroad car builders. If that market were filled and automotive requirements increased, they could return to serving auto producers with equal speed.

"We are serving a dynamic economy. We can serve it best if we are free to shift with market conditions," sales executives continue. "Looking ahead, we can see the government's road building pro-

gram taking more steel in 1958. We will have to be ready to serve that market."

Getting Ready—For 11 years, Wheeling Steel has been getting ready to serve its markets at a cost of $210 million. "It's an investment in improving efficiency, quality of products and in aiding cost reduction," officials declare. This year alone will see expenditure of $35 million—$25 million at the Yorkville, O., tin and cold-rolled sheet mill and $9 million at Steubenville for finishing facilities. The rest will be used to improve handling facilities at the Benwood, W. Va., pipe mill. The company's ingot capacity has grown from 1.4 million tons in 1947 to 2.2 million tons early this year. By the end of 1958, John L. Neudoerfer, president, expects capacity to total 2.4 million tons. That will complete Wheeling's current expansion drive.

But company officials promise more expansion news soon. One of the chief projects under consideration now is replacement of the two bessemer converters which account for more than 25 per cent of Wheeling Steel's capacity today.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 152 & 153

Little change is discerned in demand for cold-rolled sheets, galvanized sheets and narrow hot-rolled sheets. Mills are not fully booked on any of these items for second quarter. Deliveries are getting more prompt, and any pickup in orders would be readily accommodated.

Sheetmakers are scanning automobile sales reports closely. So far there has been no indication of a spring spurt that will cause the auto industry to revise its steel requirements upward. A similar situation prevails in the appliance industry where manufacturing schedules are still being cut back.

Philadelphia district sellers say carbon sheet buying for May and June is slow to develop expected volume. But both months are expected to top April tonnage. Consumption is off slightly from earlier peaks, and inventories are not being shaken out as fast as anticipated. Prompt shipments of most grades, including specialties, and heavier offerings of flat rolled tend to retard forward buying. Stainless sheet and strip demand holds up relatively well. Most makers are sold into June on the nickel grades.

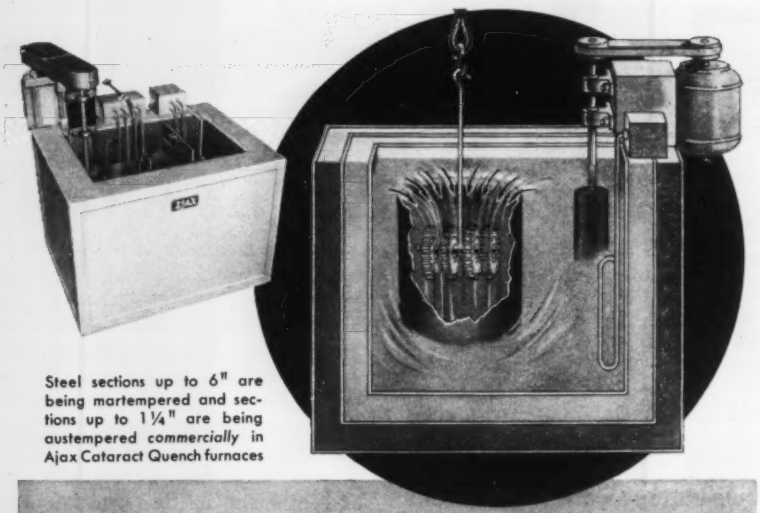
Sheet suppliers in the Pittsburgh and Cleveland market expect only a moderate upturn in automotive requirements for May. One major automotive plant supplied from Pittsburgh placed its May tonnage, which was slightly above that ordered for April. Some orders are being deferred from month to month.

Galvanized sheet demand is improving seasonally, but volume continues disappointing. Sheets for galvanized roofing are moving well at St. Louis. District mills in the St. Louis area report sheet order volume is holding steady.

Plates . . .

Plate Prices, Page 151

Northwestern Steel & Wire Co., Sterling, Ill., is rolling plates on its



Steel sections up to 6" are being martempered and sections up to 1¼" are being austempered commercially in Ajax Cataract Quench furnaces

A BIG STEP AHEAD IN ISOTHERMAL QUENCHING

AJAX
HUYGREN
Salt Bath CATARACT® QUENCH Furnace

...even for steel shapes and sizes that couldn't be austempered or martempered satisfactorily before

The quenching power of molten salt at 400° F. and above is tremendously increased by the rushing flow created in this unique Ajax "Cataract" furnace design. As a result, any steel that can be hardened satisfactorily by an oil quench can now be martempered or austempered in salt—*with all of the salt bath advantages.*

These include more uniform hardness; so little distortion that parts can usually be finish machined *before* hardening; elimination of quench cracks; and increased toughness and ductility. Also, like all salt baths, Ajax Cataract Quench Furnaces are readily mechanized.

WRITE for Ajax Martempering and Austempering case history bulletins.

AJAX ELECTRIC COMPANY
952 FRANKFORD AVE. PHILADELPHIA 23, PA.
Associates: Ajax Engineering Corp.
Ajax Electrothermic Corp.

16-in. mill. (Maximum width so far is 24 in.) It is quoting a price of $4.85 per 100 lb, f.o.b. Sterling.

Larger tonnages of semifinished steel are being diverted to the production of plates as result of the continued lag in sheet demand. Light plates produced on the strip mills are a beneficiary, and the increased flow of strip-plates already has eased supply conditions to the point where this product is in reasonably fair balance with demand.

Most mills can still get all the heavy plate, structural and wide hot-rolled sheet business they can handle.

While there is some carry-over in heavy and wide plates at eastern mills going into the second quarter, the volume is not as heavy as in previous quarters. Full mill production schedules are assured for heavy plates through midyear. Most fabricating shops are operating on low inventories.

Strip and universal mill plates, under 1 in., are in ample supply, and most eastern shops, notably tank builders, have rounded out their inventories.

Shipyard order backlogs are still rising. The Navy has just awarded contracts for eight guided-missile destroyers with four yards, $146 million. Bath Iron Works, Bath, Me., will build two and prepare plans for another six to be built by the New York Shipbuilding Corp., Camden, N. J., Todd Shipyards Inc., Seattle, and Defoe Shipbuilding Co., Bay City, Mich.

The increased availability of light-gage plates has helped freight car builders in the Pittsburgh area to meet their schedules. So much tonnage in sizes below ½-in. is entering the market that the product is in relatively free supply.

Wire . . .

Wire Prices, Pages 153 & 154

Contracts for close to $1 million of guide railing (mostly three-cable type) and fencing, for the Connecticut turnpike, are being estimated. The National Fence Co., Meriden, Conn., is low on two contracts, totaling $438,195. Two additional sections close at Hartford, Conn., Apr. 8.

Wire bookings for the second quarter are light. Heading, spring and manufacturers wire orders for May are limited; most mills are said to have thin backlogs.

Demand is spotty for upholstery coils.

Many wire consumers are following the trend in automotive procurement. They are buying close to their needs and largely for prompt delivery.

The seasonal improvement in demand for merchant wire products is not impressive.

Imported nails are underselling the domestic product.

Steel Bars . . .

Bar Prices, Page 151

Heavy machinery manufacturers, including those making earth moving and road building equipment, are doing quite well, but their operations are not quite as good as had been anticipated. They are not pressing the steel mills for bars, shapes and plates as they were earlier this year.

Demand for heavy flats and large rounds is well maintained in the East, but over-all second

and . . .

RUBBER

BABY

BUGGY

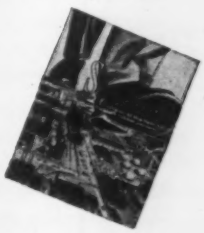
BUMPERS

All rubber part requirements are not unusual. Yes . . . we have produced parts in rubbers that have traveled far into space on our fastest jet fighters and bombers . . . and we regularly produce parts that meet the requirements of the family auto.

Stalwart is comprised of rubber specialists. Men who are capable of compounding specialized rubbers that can be fabricated into the parts and products that you produce. Production men will see to it that these parts are made to exacting specifications and delivered to you at the right price.

Check with STALWART FIRST . . . if you have a rubber part problem involving temperatures, abrasion, weathering, chemicals, petroleums or a combination of these. Check with STALWART FIRST . . . if the part is intricate . . . or if it is just a . . . rubber baby buggy bumper!

Write today for your copy of 56-SR-3.



7350-SR

STALWART RUBBER COMPANY

Manufacturing Plants in Bedford, Ohio and Jasper, Georgia
Main Offices at 167 Northfield Road • Bedford, Ohio

quarter buying of carbon bars (hot rolled and cold drawn) is picking up momentum slowly. Cold finishers and forge shops are not operating near capacity in most cases and are placing little additional hot-rolled tonnage. They are working largely on inventories.

Alloy bar demand is about on a par with that for the carbon grades.

Carbon and alloy consumption has slipped in New England. Textile machinery, forge shop and screw machine volume was off 10 to 30 per cent in the first quarter, compared with what it was a year ago. The decline was the sharpest in textile machinery.

Reflecting substantial inventories and the availability of prompt shipment tonnage, consumers are not placing forward orders. May bookings are picking up slowly, with warehouses, forge shops and converters entering the market for fairly sizable tonnages. Lack of sustained schedules for automotive forgings is a deterrent to forward ordering. Cold-finishing schedules are usually no better than 75 per cent of capacity in New England. The only improvement in demand in the area is in stainless bars, nickel grades, on government contracts.

Pittsburgh mills report a trickle of late orders is improving the April sales picture. Demand overall, however, continues at low ebb. Cold-drawn mills are virtually competing with the warehouses for orders.

To handle increased volume, Bethlehem's Los Angeles plant is adding storage facilities

Tin Plate . . .

Tin Plate Prices, Page 153

U.S. Steel Corp., Pittsburgh, will institute a "price in effect at time of shipment" policy on tin mill products next Jan. 1. Tin mill products include tin plate, terne plate and black plate.

Since U.S. Steel is the largest producer of tin mill products, it is likely that its action will set a pattern that other producers will follow.

Since Mar. 31, 1953, tin mill products have been priced for a six-month period. Before that, they were priced on a calendar year basis. All other forms of steel have long been sold on the basis of the price in effect at time of shipment.

The final six-month pricing period for tin mill products will start on Apr. 30 and end on Oct. 31. Tin mill prices will rise an average of 4.5 per cent on Apr. 30. It is yet to be determined what pricing will be in effect between Oct. 31 and Jan. 1.

Consumers, principally canmakers, have indicated they will take all the tin plate that can be shipped by Apr. 30. Their object: Beat the price increase applying after that date.

Tin plate production is running full, and mill operations will continue unchanged, but by month end the mills will be pretty well cleaned of stocks.

Shipments of metal cans in January totaled 313,727 tons, surpassing the 267,144 tons shipped in December and compared with the revised figure of 293,131 in January a year ago.

Tubular Goods . . .

Tubular Goods Prices, Page 155

Slight improvement in demand for buttweld pipe is noted. Pittsburgh area mills say inquiries are heavier for tonnage to be shipped this quarter. Total volume is still low, but the renewed buyer interest is interpreted as indicating substantial tonnage will come out from the home builders and other users in May and June.

Buttweld pipe has been moving sluggishly for some months. The pickup in inquiry is a reflection of the beginning of a seasonal climb in orders. Better demand also is noted in New England and the Midwest.

Distributors' stocks in New England are ample to meet the bulge in buttweld demand in that area. Prompt deliveries and some tie-in selling by the mills have maintained stocks.

Second quarter production of oil country goods and specialties is pretty well booked up. Users of oil country tubing have found it easier to place orders this year than it has been in several years. Few mills are accepting third quarter orders.

Seamless pipe (5-in. and over) is reported in somewhat better supply for second and third quarters. Demand is heavier, noticeably on the part of utilities. Carbon and alloy pressure tubing for power plant installations is in strong demand.

The cast iron pipe market is quiet, but demand prospects are described as promising. Sellers anticipate an active buying season, once the seasonal upturn in construction gets going in a big way.

Stainless Steel . . .

Stainless Steel Prices, Page 155

A softer tone in the stainless steel market does not worry T. S. Fitch, president, Washington Steel Corp., Washington, Pa.

"I don't know how long this softness may last, but the total volume should still be satisfactory," he says. "I believe that the stainless steel industry will increase its production at a more rapid rate than does the basic steel industry."

Fluctuations in the stainless industry tend to be more rapid and more extreme than those for basic steel, Mr. Fitch observes. "The present situation does not seem to be an exception. There has been quite a sharp decline in incoming orders and in backlogs; in some cases these declines are apparently around 25 per cent. Undoubtedly, the reduced activity in the automobile industry has a lot to do with this.

"As usual, our company is not experiencing quite as much of a fluctuation as some of the other stainless producers, and I think this is because we have never devoted as much of our capacity to the automobile industry as have many of the other stainless steel producers."

The easing in the stainless market is giving producers some advantage. It has contributed to a decline in the price of stainless steel scrap, one of their raw materials.

Warehouse . . .

Warehouse Prices, Page 156

Steel warehouse operators continue to report good sales volume and improving stocks, with the exception of heavy plates and wide flange structurals. Dis-

tributors' inventories of sheet products and bars are complete, and offerings by the mills are not being taken fully in all instances.

First quarter tonnage moved by distributors in the East, notably the standard carbon product warehouses, was around 5 to 10 per cent lower than in the corresponding three months a year ago. Dollar volume was slightly higher due to increased prices. Part of the decline in tonnage is attributed to limited stocks of plates and structurals. Galvanized sheet volume was disappointing.

Some distributors are reported trimming their inventories of bars and sheets. This is the case at Pittsburgh where first quarter business was disappointing. In some instances, cold-drawn bar producers are competing with the warehouses for orders.

Pig Iron . . .

Pig Iron Prices, Page 156

Although demand for pig iron and coke is spotty, iron shipments continue in substantial volume. For one thing, automotive and building product foundries (notably in the Midwest) are not as busy as had been anticipated earlier this year.

Also, prices of the cast grades of scrap are off. Compared with pig iron, their use in furnace and cupola melts is more attractive.

With two blast furnaces at the Wickwire Spencer plant in the Buffalo area still closed by strike, pig iron output in that district continues below capacity.

Foundries continue to order iron on a hand-to-mouth basis, depending on comfortable inventories accumlated before the recent price increase.

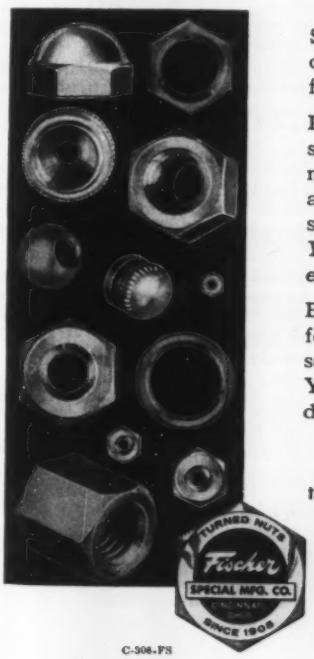
Orders for castings are spotty. As a result, the outlook for merchant pig iron demand is not too exciting. Sellers anticipate good second quarter volume, but demand is not likely to be "rushing."

Iron Ore . . .

Iron Ore Prices, Page 157

Iron ore imports were a record 34 million net tons last year, marking an eleven-fold increase since World War II, reports the American Iron & Steel Institute. Receipts were nearly 30 per cent

Fischer
hatches "specials"
every day!



Special and odd size nuts . . . brass or aluminum . . . are "duck soup" for Fischer.

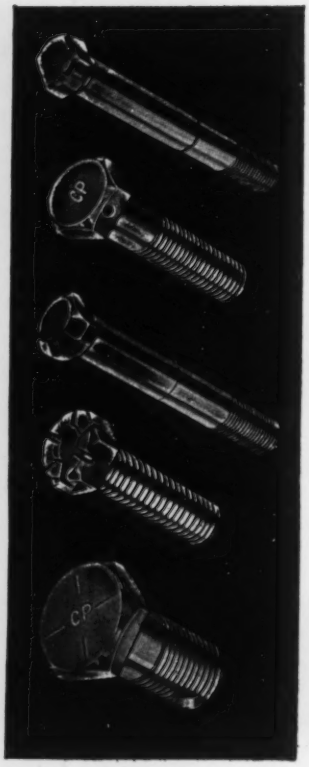
Precision-turned on unique high-speed machinery, Fischer nuts set new standards of uniformity and accuracy that will speed your assembly operations . . . and cut costs. *Yet you pay no more for Fischer's extra quality!*

Before you place your next order for brass or aluminum "specials", send your specifications to Fischer. You will receive prompt price and delivery quotations.

there's no premium for precision with
Fischer
FISCHER SPECIAL MFG. CO.
476 Morgan St. • Cincinnati 6, Ohio

C-308-FS

what's so special about precision?



To this little fellow building the 1956 "dream car", precision is a bent nail or a split board. To modern automotive engines and aircraft power plants, PRECISION is a most important element. That is why CHANDLER specialists are working harder than ever to supply cap screws to closer tolerances to meet your new requirements. Chandler is producing the finest fasteners today in all of its 25 years of experience. Chandler is specializing in mass production of bolts from high alloy steels . . . with special heads or threads . . . with drilled heads or shanks . . . ground to close tolerances . . . and with threads rolled after heat treating.

There is a Chandler cold wrought fastener to meet your specifications. And remember, at Chandler . . . there is nothing special about PRECISION because we do it every day.

6862-CH

Write today for Bulletin 1264-CH

CHANDLER PRODUCTS CORPORATION

1488 CHARDON ROAD • CLEVELAND 17, OHIO

above the previous record (26.3 million tons in 1955). Imports have gained every year, except one, since 1946, when the total was 3.1 million tons.

During 1956, more than 45 per cent of total iron ore imports came from Canada, and nearly 47 per cent from a group of seven Latin American countries.

The speed with which imports are growing is shown by comparisons with 1946 figures. Imports during August, 1956, were more than 4.5 million net tons—a record for any single month, and 47 per cent more than the total iron ore received from 19 foreign sources in 1946. During each of four other months of last year (May, June, September and October), imports were also higher than the total for 1946.

The three largest of 18 foreign ore sources last year were: Canada, 15.4 million tons; Venezuela, 10.4 million; Peru, 2 million. Four other countries, Brazil, Chile, Liberia and Sweden, each accounted for more than 1 million tons.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 151

Bar business is doing well in the Midwest, with rolling cycles continuing at about 60 days. To some extent this is due to the heavier production of reinforcing bars. Already this product is more readily available, and demand is a little less pressing than it has been.

With the big construction period of the year ahead, there is no indication that concrete bars could get in oversupply this summer.

On the West Coast, bar mills continue to operate close to capacity. Backlogs are reported sufficiently heavy to assure high level operations going into the third quarter.

Bethlehem Pacific Coast Steel Corp. will furnish 2200 tons of bars for the new refinery of the Texaco Co. at Anacortes, Wash.

Machine Firm Diversifies

Monumental Machine Co., Baltimore, organized Monumental Steel Fabricators which will occupy a 7600 sq-ft building adjacent to its plant.

Structural Shapes . . .

Structural Shape Prices, Page 151

Standard structurals and bar shapes are in better supply. Wide flange sections continue hard to get.

Although structural steel deliveries are nearer schedule in the East, there is some carry-over wide flange tonnage from the first quarter. Area fabricating shops are estimating less tonnage, and scattered industrial construction in the district is held in abeyance.

Supplies of angles and channels at Pittsburgh have improved considerably. Several construction companies report that those items present no supply problem for the second quarter. Improvement is said to result from gains in warehouse stocks. Mill quotas are unchanged, but deliveries are more on time.

The shortage of capacity keeps wide flange beams in the scarce category. Distributors have not been able to build up stocks of these sections.

In New England, shops are shipping more tonnage than they are booking. Bridge estimating there is lagging. The federal highway program has slowed down because of delays in engineering and certain planning changes.

Power plant expansions account for 5000 tons in New England. School requirements are heavy. They are taking lighter material, supplies of which are improved. New Hampshire is coming out shortly with a 4500-ton bridge list, the largest involving 1400 tons at Merrimack. Connecticut shops will fabricate 2330 tons for a brass mill.

West coast fabricators anticipate a seasonal resurgence in demand. Except for heavy structural plates, steel supplies are improved in the area. At $569,000, the Independent Iron Works, Oakland, Calif., underbid Seattle fabricators for the superstructure of the Washington (state) Narrows bridge.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 157

Coke production rose 0.2 per cent in January, compared with output the preceding month, but was almost 100,000 tons under the January, 1956, figure, reports the U.S. Bureau of Mines. The slight increase was due to a rise of nearly 12 per cent in beehive coke production. Average daily output of oven coke dropped 372 tons.

Total output (oven and beehive) was 6,850,602 net tons in the month, of which 6,604,384 tons were oven coke, and 246,218 tons, beehive. In January, 1956, output totaled 6,920,770 tons, of which 6,660,922 were oven coke, and 259,848 tons, beehive.

Continued strong demand for metallurgical coke caused producing January. Stocks at the end of the month were 2,096,373 net tons, equivalent to 9.8 days' production. A year ago on the same date, stocks were 1,648,673 tons, according to the Bureau's figures.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2330 tons, mill building, Scovill Brass Co., New Milford, Conn., to the Berlin Construction Co., Berlin, Conn.; Turner Construction Co., Boston, general contractor.

1500 tons, six span girder-stringer bridge, Massena, N.Y., to the Phoenix Bridge Co., Phoenixville, Pa.; Massachusetts Northern Construction Co., Lawrence, Mass., is general contractor.

1000 tons, Washington state, Narrows Highway bridge, to Independent Iron Works, Oakland, Calif., low at $569,000.

500 tons, mill building, Bundy Tubing Co., Winchester, Ky., to Ernst Construction Corp., Buffalo, through the Struck Construction Co., Louisville, general contractor.

500 tons or more, plant building, Electric Products Division, Corning Glass Works, Greenville, O., to the American Bridge Division, U.S. Steel Corp., Pittsburgh, and Truscon Steel Division, Republic Steel Corp., Youngstown, through the Maxon Construction Co., Dayton, O., general contractor.

500 tons or more, dormitories and service buildings, University of Missouri, to Sonken-Galamba Corp., Kansas City, Mo., and Construction Products Co., Kansas City, Mo., through J. E. Dunn Construction Co., Kansas City, Mo., general contractor.

450 tons, six-span composite beam bridge, Quinebaug river, Brooklyn-Plainfield, Conn., to the Phoenix Bridge Co., Phoenixville, Pa.; Halloran Construction Co., Providence, R.I., is general contractor.

250 tons, fuel accessories overhaul building, NAS, Norfolk, Va., to the Globe Construction Co., Norfolk, through the Blythe-Conner Co., Norfolk, general contractor.

205 tons, supermarket, King Cole Stores, Bridgeport, Conn., to the Leak & Nelson Co., Bridgeport; E. & F. Construction Co., Bridgeport, general contractor.

150 tons, stringer bridge, Orange-Wendell, Mass., to the Phoenix Bridge Co., Phoenixville, Pa.; S. & M. Construction Co., Providence, R.I., general contractor.

165 tons, state highway bridge, Springfield, Vt., to the Vermont Structural Steel Co., Burlington, Vt.; Whitcomb Construction Co., general contractor.

STRUCTURAL STEEL PENDING

4500 tons, highway bridges, including 1400 tons, Merrimack, State of New Hampshire; bids out shortly, Concord, N. H.

950 tons, truss bridges, Woonsocket, R.I.; bids out for estimates in April, Providence, R.I.

130 tons, Eagle gorge flood control dam; bids to the U.S. Engineer, Seattle, May 2.

100 tons or more, 3-story hangar addition for the United Air Lines, Seattle International Airport; bids Apr. 23.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2200 tons, refinery project, Texaco Co., Anacortes, Wash., to the Bethlehem Pacific Coast Steel Corp., Seattle; Bechtel Corp., San Francisco, general contractor.

1170 tons, state office building, Montgomery, Ala., to the Ceco Steel Products, Birmingham; A. C. Samford Inc., Albany, Ga., general contractor; structurals, to the Plowden Co., Columbia, S.C.

400 tons, Washington state highway bridge, Spokane county, to the Bethlehem Pacific Coast Steel Corp., Seattle; Donald M. Drake & Co., Portland, Oreg., general contractor.

300 tons, high school, Pointe a la Hache, La., to the Truscon Steel Division, Republic Steel Corp., New Orleans; Farnsworth & Chambers Co. Inc., New Orleans, general contractor; structurals, Orleans Material & Equipment Co., New Orleans.

250 tons, textile fiber plant, Dow Chemical Co., Lee Hall, Va., to the Virginia Steel Co., Richmond, Va.; Daniel Construction Co., Richmond, general contractor.

200 tons, hard board plant, Johns-Manville Corp., Natchez, Miss., to the Truscon Steel Division, Republic Steel Corp., Youngstown; J. A. Jones Construction Co., Charlotte, N.C., general contractor.

170 tons, armory-fieldhouse, University of Tennessee, Knoxville, Tenn., to the Wilson-Weesner-Wilkinson Co., Knoxville; V. L. Nicholson Co., Knoxville, general contractor.

160 tons, early warning installation, Nikolfsky, Alaska, to the Northwest Steel Rolling Mills Inc., Seattle; Baker & Ford, Bellingham, Wash., general contractor.

145 tons, state highway bridge, Quinebaug river, Brooklyn-Plainfield, Conn., to the Scherer Steel Co., Hartford, Conn.; Halloran Construction Co., Providence, R.I., general contractor.

140 tons, Washington state King county overcrossing, to the Bethlehem Pacific Coast Steel Corp., Seattle; Northwest Construction Co., Seattle, general contractor.

110 tons, fuel accessories overhaul building, NAS, Norfolk, Va., to the Virginia Steel Co., Richmond, Va., through Blythe-Conner Co., Norfolk, general contractor.

REINFORCING BARS PENDING

135 tons, two Washington state slab bridges, Thurston county; bids to Olympia, Wash., Apr. 2.

115 tons, Washington state highway span, Watcom county; general contract to C. B. Croy, Bellingham, Wash., low at $143,791.

PLATES . . .

PLATES PENDING

1000 tons or more, eight underground storage tanks, total capacity 128,000 bbl; also a concrete pier and facilities, Adak, Alaska; bids to the Seventeenth Naval District, Seattle, Apr. 25.

100 tons, including pipe and miscellaneous, Hayden Lake, Idaho, project; bids in to the Bureau of Reclamation.

PIPE . . .

STEEL PIPE PLACED

2600 tons, 16-in., steel pipe piling, replacement, pier 7, naval shipyard, Boston, to the Albert Pipe & Supply Co., Brooklyn, N.Y.; J. F. White Contracting Co., Cambridge, Mass., general contractor.

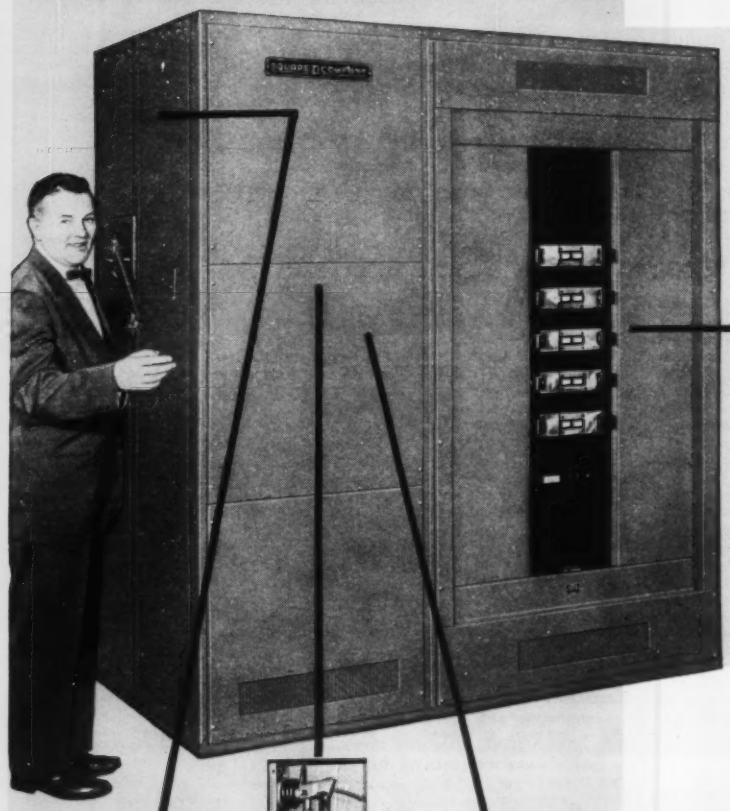
CAST IRON PIPE PLACED

155 tons, for Wenatchee, Wash.; to the Pacific States Cast Iron Pipe Co., Seattle.

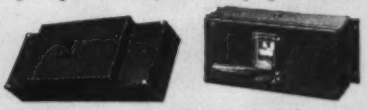
103 tons, Centralia and Auburn, Wash., to the Pacific States Cast Iron Pipe Co., Seattle.

SQUARE D's NEW Unit Substation

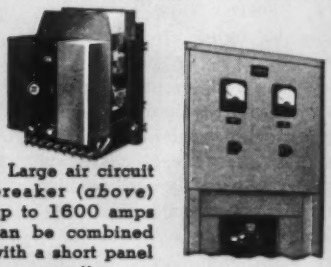
IN POWER-STYLE CONSTRUCTION



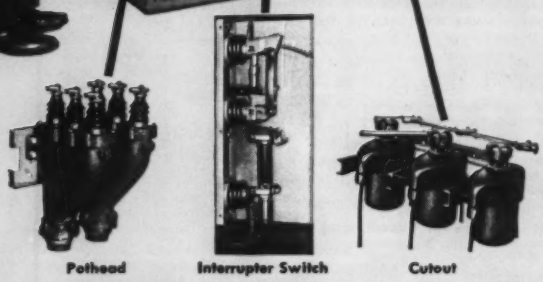
Designed to match Square D's Power-Style switchboards and control centers, these new Unit Substations meet NEMA, ASA, and AIEE standards. Available from 75 to 500 KVA; in primary voltages up to 4800V; secondary up to 600V.



Molded case circuit breakers (*left*) up to 800 amperes and QMB Saflex fusible switches (*right*) up to 600 amperes are available in compact panel construction.

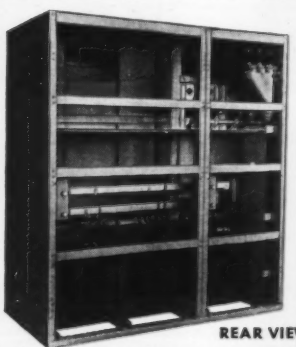


Large air circuit breaker (*above*) up to 1600 amps can be combined with a short panel in one section.



Pothead | Interrupter Switch | Cutout

Potheads, fused or unfused load break air-interrupter switches and fused or unfused oil-filled cutouts are available. Air-interrupter switches and cutouts are easily accessible from front of Substation.



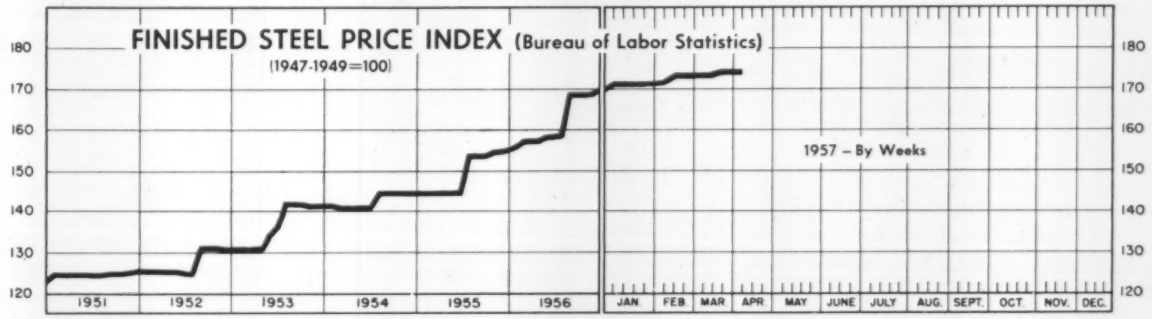
REAR VIEW

3 single phase, dry-type transformers individually mounted on base in ventilated enclosure—heating and vibration held to a minimum. Transformers easily accessible for maintenance and inspection. When no air circuit breaker or metering equipment is used, entire area at top left is available for pull box.

NOW...EC&M PRODUCTS ARE A PART OF THE SQUARE D LINE!

SQUARE D COMPANY

Price Indexes and Composites



Apr. 2, 1957	Week Ago	Month Ago	Mar. Avg	Year Ago
174.0	174.0	173.9	173.9	157.1

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Apr. 2

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard, No. 1	$5.350	Bars, Reinforcing	5.788
Rails, Light, 40 lb	6.817	Bars, C.F., Carbon	9.910
Tie Plates	6.275	Bars, C.F., Alloy	13.450
Axles, Railway	9.400	Bars, C.F., Stainless, 302 (lb)	0.533
Wheels, Freight Car, 33 in. (per wheel)	57.50	Sheets, H.R., Carbon	5.945
Plates, Carbon	5.900	Sheets, C.R., Carbon	6.789
Structural Shapes	5.667	Sheets, Galvanized	8.220
Bars, Tool Steel, Carbon (lb)	0.480	Sheets, C.R., Stainless, 302 (lb)	0.660
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.585	Sheets, Electrical	11.225
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.274	Strip, C.R., Carbon	8.843
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.769	Strip, C.R., Stainless, 430 (lb)	0.475
Bars, H.R., Alloy	10.150	Strip, H.R., Carbon	6.000
Bars, H.R., Stainless, 303 (lb)	0.508	Pipe, Black, Buttweld (100 ft)	18.894
Bars, H.R., Carbon	6.075	Pipe, Galv, Buttweld (100 ft)	23.034
		Pipe, Line (100 ft)	190.108
		Casing, Oil Well, Carbon (100 ft)	185.566
		Casing, Oil Well, Alloy (100 ft)	288.980
		Tubes, Boiler (100 ft)	46.737
		Tubing, Mechanical, Carbon (100 ft)	23.713
		Tubing, Mechanical, Stainless, 304 (100 ft)	197.663
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.433
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.133
		Black Plate, Canmaking Quality (95 lb base box)	7.233
		Wire, Drawn, Carbon	9.775
		Wire, Drawn, Stainless, 430 (lb)	9.630
		Bale Ties (bundle)	7.213
		Nails, Wire, 8d Common	9.365
		Wire, Barbed (80-rod spool)	8.412
		Woven Wire Fence (20-rod roll)	20.505

STEEL's FINISHED STEEL PRICE INDEX*

	Apr. 3 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	227.41	227.41	227.41	209.10	171.92
Index in cents per lb	6.161	6.161	6.161	5.665	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel NT	$139.71	$139.71	$139.51	$128.02	$106.32
No. 2 Fdry Pig Iron, GT	64.70	64.70	63.70	60.06	52.54
Basic Pig Iron, GT	64.23	64.23	63.24	59.61	52.16
Malleable Pig Iron, GT	65.77	65.77	64.49	61.06	53.27
Steelmaking Scrap, GT	45.00	47.67	51.67	54.17	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Revised.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Apr. 3 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.075	5.075	5.075	4.65	3.70
Bars, H.R., Chicago	5.075	5.075	5.075	4.65	3.70
Bars, H.R., deld., Philadelphia	5.365	5.365	5.365	4.93	4.223
Bars, C.F., Pittsburgh	6.85*	6.85*	6.85*	6.25*	4.55
Shapes, Std., Pittsburgh	5.00	5.00	5.00	4.60	3.65
Shapes, Std., Chicago	5.00	5.00	5.00	4.60	3.65
Shapes, deld., Philadelphia	5.31	5.31	5.31	5.00	3.918
Plates, Pittsburgh	4.85	4.85	4.85	4.50	3.70
Plates, Chicago	4.85	4.85	4.85	4.50	3.70
Plates, Coatesville, Pa.	5.25	5.25	5.25	4.80	4.15
Plates, Sparrows Point, Md.	4.85	4.85	4.85	4.50	3.70
Plates, Claymont, Del.	5.70	5.70	5.70	4.80	4.15
Sheets, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.60-3.75
Sheets, H.R., Chicago	4.675	4.675	4.675	4.325	3.60
Sheets, C.R., Pittsburgh	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Chicago	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Detroit	5.75-5.85	5.75-5.85	5.75-5.85	5.325-5.425	4.55
Sheets, Galv., Pittsburgh	6.30	6.30	6.30	5.85	4.80
Strip, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.75-4.00
Strip, H.R., Chicago	4.675	4.675	4.675	4.325	3.50
Strip, C.R., Pittsburgh	6.85	6.85	6.85	6.25	4.65-5.35
Strip, C.R., Chicago	6.85	6.85	6.85	6.25-6.35	4.90
Strip, C.R., Detroit	6.95	6.95	6.95	6.35	4.85-5.60
Wire, Basic, Pittsburgh	7.20	7.20	7.20	6.60	4.85-5.10
Nails, Wire, Pittsburgh	8.49	8.49	8.49	7.60	5.90-6.20
Tin plate (1.50 lb), box, Pitts.	$9.95	$9.95	$9.95	$9.45	$8.70

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$91.50	$91.50	$91.50	$84.50	$66.00
Wire rods, ⅜-⅝" Pitts.	5.80	5.80	5.80	5.375	4.10-4.30

PIG IRON, Gross Ton

	Apr. 3 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$65.50	$65.50	$64.50	$61.00	$53.00
Basic, Valley	64.50	64.50	64.50	60.00	52.00
Basic, deld., Phila.	68.38	68.38	66.26	63.76	56.61
No. 2 Fdry, NevilleIsland,Pa.	65.00	65.00	65.00	60.50	52.50
No. 2 Fdry, Chicago	65.00	65.00	64.00	60.50	52.50
No. 2 Fdry, deld., Phila.	68.88	68.88	66.76	64.26	52.50
No. 2 Fdry, Birm.	59.00	59.00	59.00	55.00	57.11
No. 2 Fdry(Birm.)deld.Cin.	66.70	66.70	66.70	62.70	48.88
Malleable, Valley	65.00	65.00	64.00	60.50	55.49
Malleable, Chicago	65.00	65.00	64.00	60.50	52.50
Ferromanganese, Duquesne	255.00†	255.00†	255.00†	215.00†	188.00*

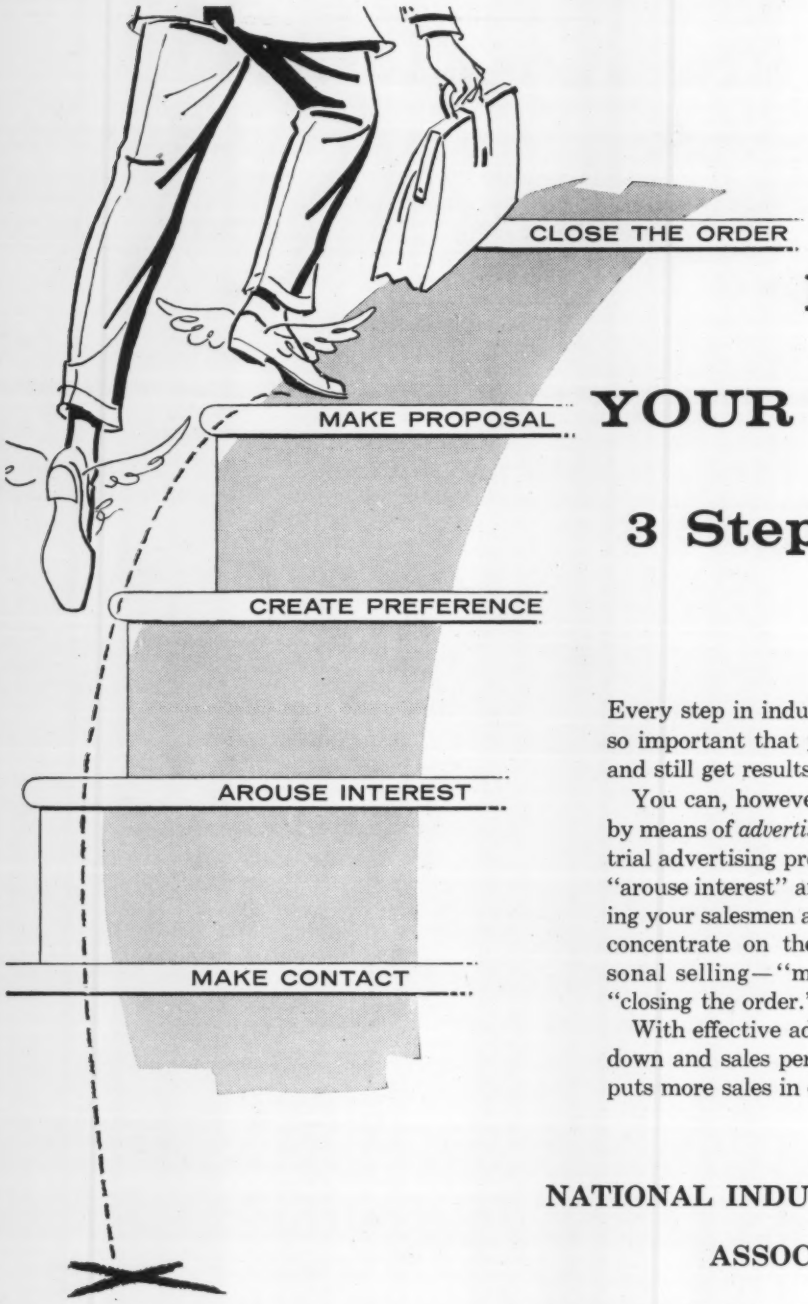
†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$43.50	$46.50	$51.50	$54.50	$44.00
No. 1 Heavy Melt, E. Pa.	50.00	52.00	56.00	53.50	42.50
No. 1 Heavy Melt, Chicago	41.50	44.50	47.50	54.50	42.50
No. 1 Heavy Melt, Valley	39.50	44.50	48.50	58.50	44.00
No. 1 Heavy Melt, Cleve.	37.00	41.50	45.50	56.00	43.00
No. 1 Heavy Melt, Buffalo	43.50	48.50	50.50	52.50	43.00
Rails, Rerolling, Chicago	55.50	59.50	61.00	72.50	52.50
No. 1 Cast, Chicago	39.50	41.50	45.50	51.50	49.00

COKE, Net Ton

Beehive, Furn, Connlsvl.	$15.25	$15.25	$15.25	$14.125	$14.75
Beehive, Fdry, Connlsvl.	18.00	18.00	18.00	16.50	17.50



Put YOUR Salesmen 3 Steps Ahead

Every step in industrial selling is important—so important that you can't skip any of them and still get results.

You can, however, take the first three steps by means of *advertising*. A well-balanced industrial advertising program can "make contact," "arouse interest" and "create preference," giving your salesmen a three-step lead so they can concentrate on the steps which require personal selling—"making the proposal" and "closing the order."

With effective advertising, cost per call goes down and sales per call go up, for advertising puts more sales in every salesman's day.

NATIONAL INDUSTRIAL ADVERTISERS ASSOCIATION, INC.

271 Madison Avenue, New York 16, N. Y.

An organization of over 4000 members engaged in the advertising and marketing of industrial products, with local chapters in ALBANY, BALTIMORE, BOSTON, BUFFALO, CHICAGO, CLEVELAND, COLUMBUS, DALLAS-FORT WORTH, DENVER, DETROIT, HAMILTON, ONT., HARTFORD, HOUSTON, INDIANAPOLIS, LOS ANGELES, MILWAUKEE, MINNEAPOLIS-ST. PAUL, MONTREAL, QUE., NEWARK, NEW YORK, PHILADELPHIA, PITTSBURGH, PORTLAND, ROCHESTER, ROCKFORD, ST. LOUIS, SAN FRANCISCO, TORONTO, ONT., YOUNGSTOWN.

Steel Prices

Mill prices as reported to STEEL, Apr. 3, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 152; to footnotes, page 154.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$70.50

INGOTS, Alloy (NT)

Detroit R7 .....$74.00
Houston S5 .....74.00
Midland,Pa. C18 .....74.00
Munhall,Pa. U5 .....74.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Bessemer,Pa. U5 ....$74.00
Bridgeport,Conn. N19 ..79.00
Buffalo R2 .....74.00
Clairton,Pa. U5 .....74.00
Ensley,Ala. T2 .....74.00
Fairfield,Ala. T2 .....74.00
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....74.00
Johnstown,Pa. B2 .....74.00
Lackawanna,N.Y. B2 ..74.00
LoneStar,Tex. L6 ....80.00
Munhall,Pa. U5 .....74.00
S.Chicago,Ill. R2, U5..74.00
S.Duquesne,Pa. U5 ....74.00
Sterling, Ill. N15 .....74.00
Youngstown R2 .....74.00

Carbon, Forging (NT)

Bessemer,Pa. U5 ....$91.50
Bridgeport,Conn. N19 ..96.50
Buffalo R2 .....91.50
Canton,O. R2 .....94.00
Clairton,Pa. U5 .....91.50
Conshohocken,Pa. A3 ..96.50
Ensley,Ala. T2 .....91.50
Fairfield,Ala. T2 ....91.50
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....91.50
Geneva,Utah C11 .....91.50
Houston S5 .....96.50
Johnstown,Pa. B2 .....91.50
Lackawanna,N.Y. B2 ..91.50
LosAngeles B3 .....101.00
Midland,Pa. C18 .....91.50
Munhall,Pa. U5 .....91.50
Seattle B3 .....105.00
S.Chicago R2, U5, W14 91.50
S.Duquesne,Pa. U5 ....91.50
S.SanFrancisco B3 ...101.00

Alloy, Forging (NT)

Bethlehem,Pa. B2 ..$107.00
Bridgeport,Conn. N19 .107.00
Buffalo R2 .....107.00
Canton,O. R2 .....107.00
Conshohocken,Pa. A3 .114.00
Detroit R7 .....107.00
Fontana,Calif. K1 ....128.00
Gary,Ind. U5 .....107.00
Houston S5 .....112.00
Ind.Harbor,Ind. Y1 ..107.00
Johnstown,Pa. B2 ....107.00
Lackawanna,N.Y. B2 .107.00
LosAngeles B3 .....127.00
Massillon,O. R2 .....107.00
Midland,Pa. C18 .....107.00
Munhall,Pa. U5 .....107.00
S.Chicago R2,U5,W14 .107.00
S.Duquesne,Pa. U5 ..107.00
Struthers,O. Y1 .....107.00
Warren,O. C17 .....107.00

ROUNDS, SEAMLESS TUBE (NT)

Bridgeport,Conn. N19 $116.50
Buffalo R2 .....111.50
Canton,O. R2 .....114.00
Cleveland,O. R2 ....111.50
Gary,Ind. U5 .....111.50
S.Chicago,Ill. R2, W14..111.50
S.Duquesne,Pa. U5 ..111.50

SKELP

Aliquippa,Pa. J5 .....4.725
LoneStar,Tex. L6 ....5.025
Munhall,Pa. U5 .....4.625
Warren,O. R2 .....4.625
Youngstown R2, U5 ..4.625

WIRE RODS

AlabamaCity,Ala. R2 ..5.80
Aliquippa,Pa. J5 .....5.80
Alton,Ill. L1 .....6.00
Buffalo W12 .....5.80
Cleveland A7 .....5.80
Donora,Pa. A7 .....5.80
Fairfield,Ala. T2 .....5.80
Houston S5 .....6.05
IndianaHarbor,Ind. Y1..5.80
Johnstown,Pa. B2 .....5.80
Joliet,Ill. A7 .....5.80
KansasCity,Mo. S5 ....6.05
Kokomo,Ind. C16 .....5.90
LosAngeles B3 .....6.60
Minnequa,Colo. C10 ....6.05
Monessen,Pa. P17 .....5.80
N.Tonawanda,N.Y. B11 .5.80
Pittsburg,Calif. C11 ....6.60
Portsmouth,O. P12 .....5.80
Roebling,N.J. R5 .....5.90
S.Chicago,Ill. R2 .....5.80
SparrowsPoint,Md. B2 ..5.90
Sterling,Ill.(1) N15 ....5.80
Sterling,Ill. N15 .....5.90
Struthers,O. Y1 .....5.80
Worcester,Mass. A7 ....6.10

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2 .....5.00
Atlanta A11 .....5.20
Aliquippa,Pa. J5 .....5.00
Bessemer,Ala. T2 .....5.00
Bethlehem,Pa. B2 .....5.05
Birmingham C15 .....5.25
Clairton,Pa. U5 .....5.00
Fairfield,Ala. T2 .....5.00
Fontana,Calif. K1 .....5.75
Gary,Ind. U5 .....5.00
Geneva,Utah C11 .....5.00
Houston S5 .....5.10
Ind.Harbor,Ind. I-2 ....5.00
Johnstown,Pa. B2 .....5.05
Joliet,Ill. P22 .....5.00
KansasCity,Mo. S5 .....5.10
Lackawanna,N.Y. B2 ..5.05
LosAngeles B3 .....5.70
Minnequa,Colo. C10 ....5.30
Munhall,Pa. U5 .....5.00
Niles,Calif. P1 .....5.75
Phoenixville,Pa. P4 ....5.85
Portland,Oreg. O4 .....5.80
Seattle B3 .....5.75
S.Chicago,Ill. U5, W14..5.00
S.SanFrancisco B3 ....5.65
Sterling,Ill. N15 .....5.00
Torrance,Calif. C11 ....5.70
Weirton,W.Va. W6 ....5.00

Wide Flange

Bethlehem,Pa. B2 ....5.05
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....5.90
IndianaHarbor,Ind. I-2 .5.25
Lackawanna,N.Y. B2 ..5.05
Munhall,Pa. U5 .....5.00
Phoenixville,Pa. P4 ....5.85
S.Chicago,Ill. U5 .....5.00

Alloy Std. Shapes

Aliquippa,Pa. J5 .....6.20
Clairton,Pa. U5 .....6.20
Gary,Ind. U5 .....6.20
Houston S5 .....6.30
Munhall,Pa. U5 .....6.20
S.Chicago,Ill. U5 .....6.20

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5 .....7.35
Bessemer,Ala. T2 .....7.35
Bethlehem,Pa. B2 .....7.40
Clairton,Pa. U5 .....7.35
Fairfield,Ala. T2 .....7.35
Fontana,Calif. K1 .....8.10
Gary,Ind. U5 .....7.35
Geneva,Utah C11 .....7.35
Houston S5 .....7.45
Ind.Harbor,Ind. I-2, Y1.7.35
Johnstown,Pa. B2 .....7.40
KansasCity,Mo. S5 .....7.45
Lackawanna,N.Y. B2 ..7.40
LosAngeles B3 .....8.05
Munhall,Pa. U5 .....7.35
Seattle B3 .....8.10
S.Chicago,Ill. U5, W14..7.35
S.SanFrancisco B3 ....8.00
Struthers,O. Y1 .....7.35

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....7.40
Lackawanna,N.Y. B2 ..7.40
Munhall,Pa. U5 .....7.35
S.Chicago,Ill. U5 .....7.35

PILING

BEARING PILES

Bethlehem,Pa. B2 .....5.05
Lackawanna,N.Y. B2 ..5.05
Munhall,Pa. U5 .....5.00
S.Chicago,Ill. U5 .....5.00

STEEL SHEET PILING

Lackawanna,N.Y. B2 ..5.90
Munhall,Pa. U5 .....5.90
S.Chicago,Ill. U5 .....5.90

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....4.85
Aliquippa,Pa. J5 .....4.85
Ashland,Ky.(15) A10 ..4.85
Bessemer,Ala. T2 .....4.85
Clairton,Pa. U5 .....4.85
Claymont,Del. C22 ....5.70
Cleveland J5, R2 .....4.95
Coatesville,Pa. L7 .....5.25
Conshohocken,Pa. A3 ..4.95
Detroit M1 .....4.95
Ecorse,Mich. G5 .....4.95
Fairfield,Ala. T2 .....4.85
Fontana,Calif.(30) K1..5.60
Gary,Ind. U5 .....4.85
Geneva,Utah C11 .....4.85
GraniteCity,Ill. G4 ....5.05
Harrisburg,Pa. P4 .....5.80
Houston S5 .....4.95
Ind.Harbor,Ind. I-2, Y1..4.85
Johnstown,Pa. B2 .....4.85
Lackawanna,N.Y. B2 ..4.85
LoneStar,Tex. L6 .....5.20
Minnequa,Colo. C10 ....5.70
Munhall,Pa. U5 .....4.85
Newport,Ky. A2 .....4.85
Pittsburgh J5 .....4.85
Riverdale,Ill. A1 .....4.85
Seattle B3 .....5.75
Sharon,Pa. S3 .....4.85
S.Chicago,Ill. U5, W14..4.85
SparrowsPoint,Md. B2..4.85
Sterling,Ill. N19 .....4.85
Steubenville,O. W10 ....4.85
Warren,O. R2 .....4.85
Youngstown R2, U5, Y1..4.85

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 ....6.20
Fontana,Calif. K1 ....6.75
Geneva,Utah C11 .....6.25
Johnstown,Pa. B2 .....5.65
SparrowsPoint,Md. B2 ..5.65

PLATES, Wrought Iron

Economy,Pa. B14 ....11.95

PLATES, H.S., L.A.

Aliquippa,Pa. J5 .....7.25
Bessemer,Ala. T2 .....7.25
Clairton,Pa. U5 .....7.25
Claymont,Del. C22 .....7.55
Cleveland J5, R2 .....7.25
Coatesville,Pa. L7 .....7.55
Conshohocken,Pa. A3 ..7.25
Ecorse,Mich. G5 .....7.35
Fairfield,Ala. T2 .....7.25
Fontana,Calif.(30) K1 ..8.00
Gary,Ind. U5 .....7.25
Geneva,Utah C11 .....7.25
Houston S5 .....7.35
Ind.Harbor,Ind. I-2, Y1..7.25
Johnstown,Pa. B2 .....7.25
Munhall,Pa. U5 .....7.25
Pittsburgh J5 .....7.25
Seattle B3 .....8.15
Sharon,Pa. S3 .....7.25
S.Chicago,Ill. U5, W14..7.25
SparrowsPoint,Md. B2 ..7.25
Warren,O. R2 .....7.25
Youngstown U5, Y1 ....7.25

PLATES, Alloy

Aliquippa,Pa. J5 .....6.85
Claymont,Del. C22 ....6.85
Coatesville,Pa. L7 ....6.85
Fontana,Calif.(30) K1 ..7.60
Gary,Ind. U5 .....6.85
Houston S5 .....6.95
Ind.Harbor,Ind. Y1 ....6.85
Johnstown,Pa. B2 .....6.85
Munhall,Pa. U5 .....6.85
Newport,Ky. A2 .....6.85
Pittsburgh J5 .....6.85
Seattle B3 .....7.75
Sharon,Pa. S3 .....6.85
S.Chicago,Ill. U5, W14..6.85
SparrowsPoint,Md. B2 ..6.85
Youngstown Y1 .....6.85

FLOOR PLATES

Cleveland J5 .....5.925
Conshohocken,Pa. A3 ..5.925
Harrisburg,Pa. P4 ....6.275
Ind.Harbor,Ind. I-2 ..5.925
Munhall,Pa. U5 .....5.925
S.Chicago,Ill. U5 .....5.925

PLATES, Ingot Iron

Ashland c.l. (15) A10..5.10
Ashland l.c.l. (15) A10..5.60
Cleveland c.l. R2 .....5.60
Warren,O. c.l. R2 .....5.60

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala.City,Ala.(9) R2 ..5.075
Aliquippa,Pa.(9) J5 ...5.075
Alton,Ill. L1 .....5.275
Atlanta(9) A11 .....5.275
Bessemer,Ala.(9) T2 ..5.075
Birmingham(9) C15 ...5.325
Bridgeport,Conn. N19 ..5.30
Buffalo(9) R2 .....5.075
Clairton,Pa.(9) U5 ....5.075
Cleveland(9) R2 .....5.075
Ecorse,Mich.(9) G5 ....5.175
Emeryville,Calif. J7 ....5.85
Fairfield,Ala.(9) T2 ..5.075
Fairless,Pa.(9) U5 ....5.225
Fontana,Calif.(9) K1 ..5.775
Gary,Ind.(9) U5 .....5.075
Houston(9) S5 .....5.325
Ind.Harbor(9) I-2, Y1..5.075
Johnstown,Pa.(9) B2..5.075
Joliet,Ill. P22 .....5.075
KansasCity,Mo.(9) S5..5.325
Lackawanna(9) B2 ....5.075
LosAngeles(9) B3 ....5.775
Milton,Pa. M18 .....5.225
Minnequa,Colo. C10 ....5.525
Niles,Calif. P1 .....5.85
N.T'wanda,N.Y.(9)B11 5.425
Pittsburg,Calif.(9) C11..5.775
Pittsburgh(9) J5 .....5.075
Portland,Oreg. O4 .....5.85
Seattle B3, N14 .....5.825
S.Ch'c'go(9)R2,U5,W14 5.075
S.Duquesne,Pa.(9) U5..5.075
S.SanFran.,Calif.(9)B3 5.825
Sterling,Ill.(1) N15 ....5.075
Sterling,Ill. N15 .....5.175
Struthers,O. Y1 .....5.075
Torrance,Calif.(9) C11..5.775
Youngstown(9) R2, U5 5.075

BARS, H.R. Leaded Alloy (Including leaded extra)

Warren,O. C17 .....7.125

BARS, Hot-Rolled Alloy

Aliquippa,Pa. J5 .....6.125
Bethlehem,Pa. B2 .....6.125
Bridgeport,Conn. N19 ...6.20
Buffalo R2 .....6.125
Canton,O. R2 .....6.125
Clairton,Pa. U5 .....6.125
Detroit R7 .....6.125
Ecorse,Mich. G5 .....6.225
Fairless,Pa. U5 .....6.275
Fontana,Calif. K1 ....7.175
Gary,Ind U5 .....6.125
Houston S5 .....6.375
Ind.Harbor,Ind. I-2, Y1.6.125
Johnstown,Pa. B2 .....6.125
KansasCity,Mo. S5 .....6.375
Lackawanna,N.Y. B2 ..6.125
LosAngeles B3 .....7.175
Massillon,O. R2 .....6.125
Midland,Pa. C18 .....6.125
Pittsburgh J5 .....6.175
S.Chicago R2,U5,W14 ..6.125
S.Duquesne,Pa. U5 ....6.125
Struthers,O. Y1 .....6.125
Warren,O. C17 .....6.125
Youngstown U5 .....6.125

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 ....7.425
Bessemer,Ala. T2 ....7.425
Bethlehem,Pa. B2 ....7.425
Bridgeport,Conn. N19 ..7.50
Clairton,Pa. U5 .....7.425
Cleveland R2 .....7.425
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.425
Fontana,Calif. K1 ....8.125
Gary,nId. U5 .....7.425
Houston S5 .....7.675
Ind.Harbor,Ind Y1 ...7.425
Johnston,Pa. B2 .....7.425
KansasCity,Mo. S5 ....7.675
Lackawanna,N.Y. B2..7.425
LosAngeles B3 .....8.125
Pittsburgh J5 .....7.425
Seattle B3 .....8.175
S.Chicago,Ill. U5, W14.7.425
S.Duquesne,Pa. U5 ....7.425
S.SanFrancisco B3 ....8.175
Struthers,O. Y1 .....7.425
Youngstown U5 .....7.425

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa.(9) B2...5.225
Houston(9) S5 .....5.325
KansasCity,Mo.(9) S5..5.325
Lackawanna(9) B2 ....5.075
Sterling,Ill. N15 .....5.175
Sterling,Ill.(1) N15 ....5.075

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....5.075
Atlanta A11 .....5.575
Joliet,Ill. P22 .....5.075
Niles,Calif. P1 .....5.85
Pittsburgh J5 .....5.075
Portland,Oreg. O4 .....5.85
SanFrancisco S7 .....5.95

BAR SHAPES, Hot-Rolled Alloy

Aliquippa,Pa. J5 .....6.20
Clairton,Pa. U5 .....6.20
Gary,Ind. U5 .....6.20
Houston S5 .....6.45
KansasCity,Mo. S5 ....6.45
Pittsburgh J5 .....6.20
Youngstown U5 .....6.20

BARS, C.F., Leaded Alloy (Including leaded extra)

Ambridge,Pa. W18 ....9.475
BeaverFalls,Pa. M12 ..9.475
Chicago W18 .....9.475
Cleveland C20 .....9.475
LosAngeles S30 .....11.10
LosAngeles P2 .....17.35
Monaca,Pa. S17 .....9.475
Newark,N.J. W18 .....9.65
Warren,O. C17 .....9.475

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....6.85
BeaverFalls,Pa. M12,R2.6.85
Birmingham C15 .....7.45
Bridgeport,Conn. N19 ...7.20
Buffalo B5 .....6.90
Camden,N.J. P13 .....7.30
Carnegie,Pa. C12 .....6.85
Chicago W18 .....6.85
Cleveland A7, C20 .....6.85
Detroit B5, P17 .....7.05
Detroit R7 .....6.85
Donora,Pa. W8 .....6.85
Elyria,O. W8 .....6.85
FranklinPark,Ill. N5 ...6.85
Gary,Ind. U5 .....6.85
GreenBay,Wis. F7 .....6.85
Hammond,Ind. L2, M13..6.85
Hartford,Conn. R2 ....7.35
Harvey,Ill. B5 .....6.85
LosAngeles(49) S30 ....8.30
LosAngeles R2 .....8.75
LosAngeles P2 .....8.30
Mansfield,Mass. B5 ....7.40
Massillon,O. R2, R8 ....6.85
Midland,Pa. C18 .....6.85
Monaca,Pa. S17 .....6.85
Newark,N.J. W18 .....7.30
NewCastle,Pa.(17) B4 ..6.85
Pittsburgh J5 .....6.85
Plymouth,Mich. P5 ....7.10
Putnam,Conn. W18 .....7.40
Readville,Mass. C14 ....7.40
S.Chicago,Ill. W14 ....6.85
SpringCity,Pa. K3 .....7.30
Struthers,O. Y1 .....6.85
Waukegan,Ill. A7 .....6.85
Youngstown F3, Y1 ....6.85

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19.6.10

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....8.325
BeaverFalls,Pa. M12,R2 8.325
Bethlehem,Pa. B2 ....8.325
Bridgeport,Conn. N19 ..8.475
Buffalo B5 .....8.325
Camden,N.J. P13 .....8.50
Canton,O. T7 .....8.325
Carnegie,Pa. C12 ....8.325
Chicago W18 .....8.325
Cleveland A7, C20 ....8.325
Detroit B5, P17 .....8.525
Detroit R7 .....8.325
Donora,Pa. A7 .....8.325
Elyria,O. W8 .....8.325
FranklinPark,Ill. N5 ..8.325
Gary,Ind. R2 .....8.325
GreenBay,Wis. F7 .....8.325
Hammond,Ind. L2,M13 8.325
Hartford,Conn. R2 ....8.625
Harvey,Ill. B5 .....8.325
Lackawanna,N.Y. B2 ..8.325
LosAngeles S30 .....10.10
LosAngeles P2 .....10.20
Mansfield,Mass. B5 ....8.625
Massillon,O. R2, R8 ....8.325
Midland,Pa. C18 .....8.325
Monaca,Pa. S17 .....8.325
Newark,N.J. W18 .....8.50
Plymouth,Mich. P5 .....8.525
S.Chicago W14 .....8.325
SpringCity,Pa. K3 .....8.50
Struthers,O. Y1 .....8.325
Warren,O. C17 .....8.325
Waukegan,Ill. A7 .....8.325
Worcester,Mass. A7 ....8.625
Youngstown F3, Y1 ...8.325

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....5.075
Atlanta A11 .....5.275
Birmingham C15 .....5.325
Bridgeport,Conn. N9 ...5.30
Buffalo R2 .....5.075
Cleveland R2 .....5.075
Ecorse,Mich G5 .....5.425
Emeryville,Calif. J7 ....5.85

Fairfield,Ala. T2 ....5.075
Fairless,Pa. U5 .....5.225
Ft.Worth,Tex. (4) T4..5.525
Gary,Ind. U5 .....5.075
Houston S5 .....5.325
Ind.Harbor,Ind. I-2 Y1 5.075
Johnstown,Pa. B2 ....5.075
Joliet,Ill. P22 .....5.075
KansasCity,Mo. S5 ....5.325
Lackawanna,N.Y. B2 ..5.075
LosAngeles B3 .....5.775
Milton,Pa. M18 .....5.225
Minnequa,Colo. C10 ...5.525
Niles, Calif. P1 .....5.85
Pittsburg,Calif. C11 ..5.775
Pittsburgh J5 .....5.075
Portland,Oreg. O4 ....5.85
SandSprings,Okla. S5 ..5.575
Seattle B3, N14 .....5.825
S.Chicago,Ill. R2 ....5.075
S.Duquesne,Pa. U5 ....5.075
S.SanFrancisco B3 ....5.825
SparrowsPoint,Md. B2 .5.075
Sterling,Ill.(1) N15 ..5.075
Sterling,Ill. N15 .....5.175
Struthers,O. Y1 .....5.075
Torrance,Calif. C11 ..5.775
Youngstown R2, U5 ..5.075

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2 .....7.30
Chicago U8 .....6.81
Cleveland U8 .....6.79
Johnstown,Pa. ¼-1" B2 6.73
KansasCity,Mo. S5 .....7.00
Lackawanna,N.Y. B2 ..6.50
Marion,O. P11 .....6.70
NewYork U8 .....7.20
Pittsburgh J5, U8 .....6.75
Seattle B3, N14 .....7.20
SparrowsPt. ½-1" B2 ..6.73
Williamsport,Pa. S19 ..6.65

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 5.075
ChicagoHts.(4) I-2 ....6.10
ChicagoHts.(4) C2 ....5.65
Ft.Worth,Tex.(26) T4..5.525
Franklin,Pa.(3) F5 ....5.10
Franklin,Pa.(4) F5 ....6.10
JerseyShore,Pa.(4) J8 ..5.50
Marion,O.(3) P11 .....5.10
Moline,Ill.(3) R2 ....5.225
Tonawanda(3) B12 ....5.65
Tonawanda(4) B12 ....6.15
Williamsport,Pa.(3) S19 5.15

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 13.15
Economy,Pa.(D.R.)B14 16.35
Economy(Staybolt)B14. 16.80
McK.Rks.(S.R.) L5 ...13.15
McK.Rks.(D.R.) L5 ...18.00
McK.Rks.(Staybolt) L5 19.15

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.675
Allenport,Pa. P7 .....4.675
Ashland,Ky.(8) A10 ..4.675
Cleveland J5, R2 .....4.675
Conshohocken,Pa. A3..4.725
Detroit(8) M1 .....4.775
Ecorse,Mich. G5 .....4.775
Fairfield,Ala. T2 .....4.675
Fairless,Pa. U5 .....4.725
Fontana,Calif. K1 .....5.525
Gary,Ind. U5 .....4.675
Geneva,Utah C11 .....4.775
GraniteCity,Ill.(8) G4 ..4.875
Ind.Harbor,Ind. I-2, Y1 4.675
Irvin,Pa. U5 .....4.675
Lackawanna,N.Y. B2 ..4.675
Munhall,Pa. U5 .....4.675
Newport,Ky.(8) A2 ..4.675
Niles,O. M21 .....4.675
Pittsburg,Calif. C11 ..5.375
Pittsburgh J5 .....4.675
Portsmouth,O. P12 ....4.675
Riverdale,Ill. A1 .....4.675
Sharon,Pa. S3 .....4.675
S.Chicago,Ill. W14 ....4.675
SparrowsPoint,Md. B2 .4.675
Steubenville,O. W10 ..4.675
Warren,O. R2 .....4.675
Weirton,W.Va. W6 ....4.675
Youngstown U5, Y1 ...4.675

SHEETS, H.R. (19 Ga. & Lighter

Niles,O. M21 .....5.75

SHEETS, H.R. Alloy

Gary,Ind. U5 .....7.75
Ind.Harbor,Ind. Y1 ....7.75
Irvin,Pa. U5 .....7.75
Newport,Ky. A2 .....7.75
Youngstown Y1, U5 ....7.75

SHEETS, H.R. (14 Ga. & Heavier) High-strength Low-alloy

Cleveland J5, R2 .....6.90
Conshohocken,Pa. A3 ..6.95
Ecorse,Mich. G5 .....7.00
Fairfield,Ala. T2 .....6.90
Fairless,Pa. U5 .....6.95
Fontana,Calif. K1 .....7.75
Gary,Ind. U5 .....6.90
Ind.Harbor,Ind. I-2, Y1 6.90
Irvin,Pa. U5 .....6.90
Lackawanna(35) B2 ...6.90
Munhall,Pa. U5 .....6.90
Pittsburgh J5 .....6.90
S.Chicago,Ill. U5 .....6.90
SparrowsPoint(36) B2 ..6.90
Warren,O. R2 .....6.90
Weirton,W.Va. W6 ....6.90
Youngstown U5, Y1 ...6.90

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..4.925
Cleveland R2 .....5.425
Ind.Harbor,Ind. I-2 ..4.925
Warren,O. R2 .....5.425

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....5.75
Cleveland J5, R2 .....5.75
Conshohocken,Pa. A3 . 5.80
Detroit M1 .....5.75
Ecorse,Mich. G5 .....5.85
Fairfield,Ala. T2 .....5.75
Fairless,Pa. U5 .....5.80
Follansbee,W.Va. F4 ..5.75
Fontana,Calif. K1 ....7.00
Gary,Ind. U5 .....5.75
GraniteCity,Ill. G4 ....5.95
Ind.Harbor,Ind. I-2, Y1 5.75
Irvin,Pa. U5 .....5.75
Lackawanna,N.Y. B2 ..5.75
Mansfield,O. E6 .....5.75
Middletown,O. A10 ....5.75
Newport,Ky. A2 .....5.75
Pittsburg,Calif. C11 ....6.70
Pittsburgh J5 .....5.75
Portsmouth,O. P12 ....5.75
SparrowsPoint,Md. B2 ..5.75
Steubenville,O. W10 ....5.75
Warren,O. R2 .....5.75
Weirton,W.Va. W6 ....5.75
Yorkville,O. W10 .....5.75
Youngstown Y1 .....5.75

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 ....8.525
Ecorse,Mich. G5 .....8.625
Fairless,Pa. U5 .....8.575
Fontana,Calif. K1 ....9.775
Gary,Ind. U5 .....8.525
IndianaHarbor,Ind. Y1.8.525
Irvin,Pa. U5 .....8.525
Lackawanna(37) B2 ..8.525
Pittsburgh J5 .....8.525
SparrowsPoint(38) B2 .8.525
Warren,O. R2 .....8.525
Weirton,W.Va. W6 ....8.525
Youngstown Y1 .....8.525

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.50
Middletown,O. A10 ....6.25
Warren,O. R2 .....6.50

SHEETS, Culvert	Cu Steel	Cu Fe
Ashland,Ky. A10	6.65	6.90
Canton,O. R2	..6.65	7.15
Fairfield T2	....6.65	6.90
Gary,Ind. U5	....6.65	6.90
GraniteCity,Ill.G4	6.85	...
Ind.Harbor I-2	..6.65	6.90
Irvin,Pa. U5	....6.65	6.90
Kokomo,Ind. C16	6.75	...
MartinsFry. W10	6.65	...
Pittsburgh J5	....6.65	...
Pitts,Calif. C11	..7.40	...
SparrowsPt. B2	..6.65	...

SHEETS,, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....6.90
MartinsFry.,O. W10 ....6.90

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.30‡
Ashland,Ky. A10 .....6.30†
Canton,O. R2 .....6.30‡
Dover,O. R1 .....6.30†
Fairfield,Ala. T2 .....6.30†
Gary,Ind. U5 .....6.30†
GraniteCity,Ill. G4 ....6.50*
Ind.Harbor,Ind. I-2 ..6.30†
Irvin,Pa. U5 .....6.30†
Kokomo,Ind. C16 .....6.40‡
MartinsFerry,O. W10 ..6.30*
Middletown,O. A10 ...6.30†
Pittsburg,Calif. C11 ...7.05*
Pittsburgh J5 .....6.30†
SparrowsPt.,Md., B2 ..6.30†
Warren,O. R2 .....6.30†
Weirton,W.Va. W6 ....6.30*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEEETS, Well Casing

Fontana,Calif. K1 ....7.025

SHEETS, Galvanized High-Strength Low-Alloy

Irvin,Pa. U5 .....9.275
SparrowsPoint(39) B2..9.275

SHEETS, Galvannealed Steel

Canton,O. R2 .....6.70
Irvin,Pa. U5 .....6.70

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.55
Middletown,O. A10 ....6.55

SHEETS, Electrogalvanized

Cleveland(28) R2 ....7.125
Niles,O.(28) R2 .....7.125
Weirton,W.Va. W6 ....6.975

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 8.95
Butler,Pa. A10 (type 2) 9.05

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.325
Cleveland R2 .....6.325
Gary,Ind. U5 .....6.325
GraniteCity,Ill. G4 ....6.525
Ind.Harbor,Ind. I-2, Y1 6.325
Irvin,Pa. U5 .....6.325
Middletown,O. A10 ....6.325
Niles,O. M21 .....6.325
Youngstown Y1 .....6.325

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..8.35
Ind.Harbor,Ind. I-2 ..8.175
Yorkville,O. W10 ....8.175

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 6.70
Gary,Ind. U5 .....6.70
Mansfield,O. E6 .....6.70
Middletown,O. A10 ....6.70
Niles,O. M21 .....6.70
Weirton,W.Va. W6 ....6.70

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....7.10

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U.S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Dearborn Division, Sharon Steel Corp.
D4 Disston Division, H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Josiyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.
M22 Mill Strip Products Co.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U.S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&W.Co.
N19 Northeastern Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn.Coal & Iron Div., U.S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U.S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U.S. Steel Supply Div., U.S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ..4.675
Allenport,Pa. P7 .....4.675
Alton,Ill. L1 .....4.875
Ashland,Ky.(8) A10 ..4.675
Atlanta A11 .....4.875
Bessemer,Ala. T2 .....4.675
Birmingham C15 .....4.925
Buffalo(27) R2 .....4.675
Conshohocken,Pa. A3 ..4.725
Detroit M1 .....4.775
Ecorse,Mich. G5 .....4.775
Fairfield,Ala. T2 .....4.675
Fontana,Calif. K1 ....5.525
Gary,Ind. U5 .....4.675
Houston S5 .....4.925
Ind.Harbor,Ind. I-2, Y1 4.675
Johnstown,Pa.(25) B2..4.675
KansasCity,Mo. S5 ....4.925
Lackaw'na,N.Y.(25) B2 4.675
LosAngeles(25) B3 ....5.425
Minnequa,Colo. C10 ...5.775
Pittsburg,Calif. C11 ...5.425
Riverdale,Ill. A1 .....4.675
SanFrancisco S7 .....5.95
Seattle(25) B3 .....5.675
Seattle N14 .....5.675
Sharon,Pa. S3 .....4.675
S.Chicago Ill. W14 ....4.675
S.SanFrancisco(25) B3 5.425
SparrowsPoint,Md. B2..4.675
Sterling,Ill.(1) N15 ....4.675
Sterling,Ill. N15 .....4.775
Torrance,Calif. C11 ...5.425
Warren,O. R2 .....4.675
Weirton,W.Va. W6 ....4.675
Youngstown U5 .....4.675

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....7.75
Gary,Ind. U5 .....7.75
Ind.Harbor,Ind. Y1 ....7.75
LosAngeles B3 .....8.95
Newport,Ky. A2 .....7.75
Sharon,Pa. S3 .....7.75
S.Chicago,Ill. W14 .....7.75
Youngstown U5, Y1 ....7.75

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2 .....6.95
Conshohocken,Pa. A3 ...6.95
Ecorse,Mich. G5 .....7.05
Fairfield,Ala. T2 .....6.95
Gary,Ind. U5 .....6.95
Houston S5 .....7.20
Ind.Harbor,Ind. I-2, Y1..6.95
KansasCity,Mo. S5 .....7.20
Lackawanna,N.Y. B2 ..6.95
LosAngeles(25) B3 .....7.70
Seattle(25) B3 .....7.95
Sharon,Pa. S3 .....6.95
S.SanFrancisco(25) B3 ..7.70
SparrowsPoint,Md. B2...6.95
Warren,O. R2 .....6.95
Weirton,W.Va. W6 .....6.95
Youngstown U5, Y1 ....6.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ...4.925
Warren,O. R2 .....5.425

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....6.85
Baltimore T6 .....6.85
Boston T6 .....7.40
Buffalo S40 .....6.85
Cleveland A7, J5 .....6.85
Conshohocken,Pa. A3 ...6.90
Dearborn,Mich. D3 .....6.95
Detroit D2, M1, P20....6.95
Dover,O. G6 .....6.85
Ecorse,Mich. G5 .....6.95
Evanston,Ill. M22 .....6.95
Follansbee,W.Va. F4 ...6.85
Fontana,Calif. K1 .....8.70
FranklinPark,Ill. T6 ...6.95
Ind.Harbor,Ind. Y1 .....6.85
Indianapolis C8 .....7.00
LosAngeles C1 .....8.90
NewBedford,Mass. R10..7.30
NewBritain(10) S15 ...6.85
NewCastle,Pa. B4, E5 ..6.85
NewHaven,Conn. D2 ...7.30
NewKensington,Pa. A6..6.85
Pawtucket,R.I. R3 .....7.50
Pawtucket,R.I. N8 .....7.40
Pittsburgh J5 .....6.85
Riverdale,Ill. A1 .....6.95
Rome,N.Y.(32) R6 .....6.85
Sharon,Pa. S3 .....6.85
Trenton,N.J.(31) R5 ....8.30
Wallingford,Conn. W2 ..7.30
Warren,O. R2, T5 .....6.85
Weirton,W.Va. W6 .....6.85
Worcester,Mass. A7 ....7.40
Youngstown C8, Y1 ....6.85

STRIP, Cold-Rolled Alloy

Boston T6 .....14.90
Carnegie,Pa. S18 .....14.55
Cleveland A7 .....14.55
Dover,O. G6 .....14.55
FranklinPark,Ill. T6 ..14.55
Harrison,N.J. C18 .....14.55
Indianapolis C8 .....14.70
Pawtucket,R.I. N8 ....14.90
Sharon,Pa. S3 .....14.55
Worcester,Mass. A7 ...14.85
Youngstown C8 .....14.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.00
Dearborn,Mich. D3 ....10.10
Dover,O. G6 .....10.10
Ecorse,Mich. G5 .....10.10
Ind.Harbor,Ind. Y1 ....10.20
Sharon,Pa. S3 .....10.00
Warren,O. R2 .....10.00
Weirton,W.Va. W6 ....10.00
Youngstown Y1 .....10.20

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....7.60

STRIP, C.R. Electrogalvanized

Cleveland A7 .....6.85*
Dover,O. G6 .....6.85*
Evanston,Ill. M22 .....6.95
Riverdale,Ill. A1 .....6.95*
Warren,O. B9, T5 ....6.85*
Worcester,Mass. A7 ...7.40*
Youngstown C8 .....6.85*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3 .....6.975

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.40
Riverdale,Ill. A1 .....5.25
Sharon,Pa. S3 .....5.10
Youngstown U5 .....5.10

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.20	10.40	12.60	15.60	18.55
Boston T6	9.20	10.40	12.60	15.60	18.55
Bristol,Conn. W1	...	10.40	12.60	15.60	18.55
Carnegie,Pa. S18	8.65	10.10	12.30	15.30	....
Cleveland A7	8.65	10.10	12.30	15.30	18.25
Cleveland C7	...	10.10	12.30	15.30	18.25
Dover,O. G6	8.65	10.10	12.30	15.30	18.25
Detroit D2	8.75	10.20	12.40	15.40	....
Dearborn,Mich. D3	8.75	10.20	12.40	....	....
Evanston,Ill. M22	8.65	10.10	12.30	....	....
FranklinPark,Ill. T6	8.75	10.10	12.30	15.30	18.25
Harrison,N.J. C18	...	....	12.60	15.60	18.55
Indianapolis C8	8.80	10.25	12.30	15.30	18.25
LosAngeles C1	10.85	12.30	14.50	....	....
NewBritain,Conn.(10) S15.	8.65	10.10	12.30	15.30	18.25
NewCastle,Pa. B4, E5 ...	8.65	10.10	12.30	15.30	....
NewHaven,Conn. D2	9.10	10.40	12.60	15.60	....
NewKensington,Pa. A6 ..	8.65	10.10	12.30	15.30	....
New York W3	...	10.40	12.60	15.60	18.55
Pawtucket,R.I. N8	9.20	10.40	12.60	15.60	18.55
Riverdale,Ill. A1	8.75	10.10	12.30	15.30	18.25
Rome,N.Y.(32) R6	8.65	10.10	12.30	15.30	18.25
Sharon,Pa. S3	8.65	10.10	12.30	15.30	18.25
Trenton,N.J. R5	...	10.40	12.60	15.60	18.55
Wallingford,Conn. W2	9.10	10.40	12.60	15.60	18.45
Warren,O. T5	8.65	10.10	12.30	15.30	18.25
Worcester,Mass. A7, T6 ..	9.20	10.40	12.60	15.60	18.55
Youngstown C8	8.65	10.10	12.30	15.30	18.25

Spring Steel (Tempered)			Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	...	...	17.10	20.95	25.30
Buffalo W12	...	...	17.10	....	....
FranklinPark,Ill. T6	...	...	*17.45*	*21.30*	*25.65*
Harrison,N.J. C18	...	...	17.10	20.95	25.30
NewYork W3	...	...	17.10	20.95	25.30
Palmer,Mass. W12	...	...	17.10	....	....
Trenton,N.J. R5	...	...	17.10	20.95	25.30
Worcester,Mass. A7, T6..	...	...	17.10	20.95	25.30
Youngstown C8	...	...	17.45	21.30	25.65

SILICON STEEL

H.R. SHEETS(22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10..	...	....	11.00	12.05	13.05
Brackenridge,Pa. A4	...	....	11.00	12.05	13.05
Mansfield,O. E6	9.20	10.35	11.00	12.05	13.05
Newport,Ky. A2	9.20	10.35	11.00	12.05	13.05
Niles,O. M21	9.20	10.35	11.00	12.05	....
Vandergrift,Pa. U5	...	10.35	11.00	12.05	13.05
Warren,O. R2	9.20	10.35	11.00	12.05	....
Zanesville,O. A10	...	10.35	11.00	12.05	13.05
Zanesville,O. A10 (FP coils)	...	10.85	11.525	12.575	13.55
Zanesville,O. A10 (SP coils)	...	....	11.025	12.075	13.05

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	...	....	11.525	12.575	13.55
GraniteCity,Ill. G4	9.40*	10.55*	11.225*	12.275*	....
IndianaHarbor,Ind. I-2...	9.20†	10.35*	11.025*	12.075*	....
Mansfield,O. E6	9.70	10.85	11.525	12.575	13.55
Vandergrift,Pa. U5	9.20*	10.35*	11.025*	12.075*	13.05*
Vandergrift,Pa. U5	...	10.85†	11.525†	12.575†	13.55†
Warren,O. R2	9.20*	10.85	11.525	12.575	13.55

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	14.05	14.60	15.10	16.15
Brackenridge,Pa. A4	14.05	....	....	....
Vandergrift,Pa. U5	14.05	14.60	15.10	16.15
Zanesville,O. A10	14.05	14.60	15.10	16.15

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4.	16.90	18.50	19.00	19.50	....	
Butler,Pa. A10	....	....	18.50	19.00	19.50	....
Vandergrift,Pa. U5 ..	15.90	16.90	18.50	19.00	19.50	14.55**
Warren,O. R2	....	....	....	....	....	14.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.40	$8.65	$9.05
Fairfield,Ala. T2	8.50	8.75	9.15
Fairless,Pa. U5	8.50	8.75	9.15
Fontana,Calif. K1	9.15	9.40	9.80
Gary,Ind. U5	8.40	8.65	9.05
GraniteCity,Ill. G4	8.50	8.75	9.15
IndianaHarbor,Ind. I-2, Y1.....	8.40	8.65	9.05
Irvin,Pa. U5	8.40	8.65	9.05
Niles,O. R2	8.40	8.65	9.05
Pittsburg,Calif. C11	9.15	9.40	9.80
SparrowsPoint,Md. B2	8.50	8.75	9.15
Weirton,W.Va. W6	8.40	8.65	9.05
Yorkville,O. W10	8.40	8.65	9.05

ELECTROTIN (22-27 Gage; Dollars per 100 lb)	7.425	7.625	....
Aliquippa,Pa. J5	7.425	7.625	7.925
Niles,O. R2			

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5..	$9.70	$9.95
Fairfield,Ala. T2 .	9.80	10.05
Fairless,Pa. U5 ..	9.80	10.05
Fontana,Calif. K1	10.45	10.70
Gary,Ind. U5	9.70	9.95
Irvin,Pa. U5	9.70	9.95
Pitts..Calif. C11..	10.45	10.70
Sp.Pt.,Md., B2 ..	9.80	10.05
Weirton,W.Va. W6	9.70	9.95
Yorkville,O. W10.	9.70	9.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$7.50
Fairfield,Ala. T2	7.60
Fairless,Pa. U5	7.60
Fontana,Calif. K1	8.25
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. I-2, Y1..	7.50
Irvin,Pa. U5	7.50
Niles,O. R2	7.50
Pittsburg,Calif. C11	8.25
SparrowsPoint,Md. B2 ..	7.60
Weirton,W.Va. W6	7.50
Yorkville,O. W10	7.50

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5 .....$7.15
Gary,Ind. U5 .....7.15
GraniteCity,Ill. G4 .....7.25
Ind.Harbor,Ind. Y1 ....7.15
Irvin,Pa. U5 .....7.15
Yorkville,O. W10 .....7.15

MANUFACTURING TERNES (Special Coated; Base Box)

Gary,Ind. U5 .....$9.20
Irvin,Pa. U5 .....9.20

ROOFING SHORT TERNES (8 lb Coated; Base Box)

Gary,Ind. U5 .....$10.75

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..7.20
Aliquippa,Pa. J5 .....7.20
Alton,Ill. L1 .....7.40
Atlanta A11 .....7.40
Bartonville,Ill. K4 .....7.30
Buffalo W12 .....7.20
Chicago W13 .....7.20
Cleveland A7, C20 .....7.20
Crawfordsville,Ind. M8..7.30
Donora,Pa. A7 .....7.20
Duluth A7 .....7.20
Fairfield,Ala. T2 .....7.20
Fostoria,O.(24) S1 .....7.30
Houston S5 .....7.45
Jacksonville,Fla. M8 ...7.55
Johnstown,Pa. B2 .....7.20
Joliet,Ill. A7 .....7.20
KansasCity,Mo. S5 .....7.45
Kokomo Ind. C16 .....7.30
LosAngeles B3 .....8.15
Minnequa,Colo. C10 ....7.45
Monessen,Pa. P7, P16...7.20
N.Tonawanda,N.Y. B11. 7.20
Palmer,Mass. W12 .....7.50
Pittsburg,Calif. C11 ....8.15
Portsmouth,O. P12 .....7.20
Rankin,Pa. A7 .....7.20
S.Chicago,Ill. R2 .....7.20
S.SanFrancisco C10 ....8.15
SparrowsPoint,Md. B2 ..7.30
Sterling Ill.(1) N15 ....7.20
Sterling,Ill. N15 .....7.30
Struthers,O. Y1 .....7.20
Waukegan,Ill. A7 .....7.20
Worcester,Mass. A7 ....7.50

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4 ....11.90
Buffalo W12 .....11.90
Cleveland A7 .....11.90
Donora,Pa. A7 .....11.90
Duluth A7 .....11.90
Johnstown,Pa. B2 .....11.90
Minnequa,Colo. C10 ..12.025
Monessen,Pa. P16 .....11.90
Muncie,Ind. I-7 .....12.10
NewHaven,Conn. A7 ...12.20
Palmer,Mass. W12 .....12.20
Pittsburg,Calif. C11 ...12.70
Portsmouth,O. P12 .....11.90
Roebling,N.J. R5 .....12.20
SparrowsPt.,Md. B2 ...12.00
Struthers,O. Y1 .....11.75
Trenton,N.J. A7 .....12.20
Waukegan,Ill. A7 .....11.90
Worcester,Mass. A7 ....12.20

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....8.70
Alton,Ill. L1 .....8.90
Buffalo W12 .....8.70
Cleveland A7 .....8.70
Donora,Pa. A7 .....8.70
Duluth A7 .....8.70
Johnstown,Pa. B2 .....8.70
KansasCity,Mo. S5 .....8.65
Minnequa,Colo. C10 ....8.90
LosAngeles B3 .....9.65
Monessen,Pa. P7, P16 ..8.70
NewHaven,Conn. A7 ...9.00
Palmer,Mass. W12 .....9.00
Pittsburg,Calif. C11 ....9.65
Portsmouth,O. P12 .....8.70
Roebling,N.J. R5 .....8.70
S.Chicago,Ill. R2 .....8.70
S.SanFrancisco C10 ....9.35
SparrowsPt.,Md. B2 ...8.80
Struthers,O. Y1 .....8.40
Trenton,N.J. A7 .....9.00
Waukegan,Ill. A7 .....8.70
Worcester,Mass. A7 ....9.00

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....9.025
Alton,Ill. L1 .....9.225
Bartonville,Ill. K4 .....9.125
Buffalo W12 .....9.025
Cleveland A7 .....9.025
Donora,Pa. A7 .....9.025
Duluth A7 .....9.025
Fostoria,O. S1 .....9.075
Johnstown,Pa. B2 .....9.025
LosAngeles B3 .....9.975
Milbury,Mass.(12) N6..9.325
Minnequa,Colo. C10 ....9.275
Monessen,Pa. P7, P16..9.025
Muncie,Ind. I-7 .....9.225
Palmer,Mass. W12 .....9.325
Pittsburg,Calif. C11....9.975
Portsmouth,O. P12 .....9.025
Roebling,N.J. R5 .....9.025
S.Chicago,Ill. R2 .....9.025
S.SanFrancisco C10 ....9.675
SparrowsPt.,Md. B2 ...9.125
Struthers,O. Y1 .....8.725
Trenton,N.J. A7 .....9.325
Waukegan,Ill. A7 .....9.025
Worcester J4, T6, W12 9.325
Worcester,Mass. A7 ....9.325

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....14.35
Bartonville,Ill. K4 .....14.25
Buffalo W12 .....14.45
Chicago W13 .....14.45
Cleveland A7 .....14.45
Crawfordsville,Ind. M8.14.25
Fostoria,O. S1 .....14.45
Jacksonville,Fla. M8 ..14.50
Johnstown,Pa. B2 .....14.15
Kokomo,Ind. C16 .....14.45
Monessen,Pa. P6 .....14.20
Muncie,Ind. I-7 .....14.65
Palmer,Mass. W12 .....14.75
Roebling,N.J. C10 .....14.45
S.SanFrancisco C10 ....14.50
Waukegan,Ill. A7 .....14.45
Worcester,Mass. A7, T6.14.75

ROPE WIRE	(A)
Bartonville,Ill. K4	12.00
Buffalo W12	12.00
Fostoria,O. S1	12.00
Johnstown,Pa. B2	12.00
Monessen,Pa. P7	11.55
Muncie,Ind. I-7	12.20
Palmer,Mass. W12	12.30
Portsmouth,O. P12	12.00
Roebling,N.J. R5	12.30
SparrowsPt.,Md. B2 ...	12.10
Struthers,O. Y1	11.55
Worcester,Mass. J4	12.30

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE

WIRE, Tire Bead

Bartonville,Ill. K4	15.75
Monessen,Pa. P16	15.45
Roebling,N.J. R5	16.10

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	10.75
Baltimore T6	11.05
Boston T6	11.05
Buffalo W12	10.75
Chicago W13	10.85
Cleveland A7	10.75
Crawfordsville,Ind. M8	10.75
Dover,O. G6	10.75
Fostoria,O. S1	11.05
FranklinPark,Ill. T6	10.85
Kokomo,Ind. C16	10.75
Massillon,O. R8	10.75
Milwaukee C23	10.95
Monessen,Pa. P7, P16	10.75
NewKensington,Pa. A6	10.75
Palmer,Mass. W12	11.05
Pawtucket,R.I. N8	11.05
Riverdale,Ill. A1	10.85
Rome,N.Y. R6	10.75
Trenton,N.J. R5	11.05
Worcester,Mass. A7, T6	11.05

NAILS & POLISHED STAPLES, Stock

	Col.
AlabamaCity,Ala. R2	.164
Aliquippa,Pa. J5	.164
Atlanta A11	.166
Bartonville,Ill. K4	.166
Crawfordsville,Ind. M8	.166
Donora,Pa. A7	.164
Duluth A7	.164
Fairfield,Ala. T2	.164
Houston,Tex. S5	.169
Jacksonville,Fla. (20) M8	175
Johnstown,Pa. B2	.164
Joliet,Ill. A7	.164
KansasCity,Mo. S5	.169
Kokomo,Ind. C16	.166
Minnequa,Colo. C10	.169
Monessen,Pa. P7	.164
Pittsburg,Calif. C11	.183
Rankin,Pa. A7	.164
S.Chicago,Ill. R2	.164
SparrowsPt.,Md. B2	.166
Sterling,Ill. (7) N15	.166
Worcester,Mass. A7	.170

NAILS, Stock

	Col.
Chicago W13	.164
Cleveland A9	.170

(To Wholesalers; per cwt)

Galveston,Tex. D7	$8.75

NAILS, Cut (100 lb keg)
To Dealers (33)

Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)
Coil No. 3150

AlabamaCity,Ala. R2	$9.53
Atlanta A11	9.63
Bartonville,Ill. K4	9.63
Buffalo W12	9.93
Chicago W13	9.82
Crawfordsville,Ind. M8	9.63
Donora,Pa. A7	9.82
Duluth A7	9.82
Fairfield,Ala. T2	9.82
Houston S5	9.78
Jacksonville,Fla. M8	10.09
Johnstown,Pa. B2	9.53
Joliet,Ill. A7	9.82
KansasCity,Mo. S5	9.78
Kokomo,Ind. C16	9.92
LosAngeles B3	10.32
Minnequa,Colo. C10	10.07
Pittsburg,Calif. C11	10.60
S.Chicago,Ill. R2	9.53
S.SanFrancisco C10	10.31
SparrowsPt.,Md. B2	9.63
Sterling,Ill. (37) N15	9.82

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.85
Atlanta A11	9.95
Bartonville,Ill. K4	9.95
Buffalo W12	10.25
Chicago W13	10.15
Crawfordsville,Ind. M8	9.95
Donora,Pa. A7	10.15
Duluth A7	10.15
Fairfield,Ala. T2	10.15
Houston S5	10.10
Jacksonville,Fla. M8	10.41
Johnstown,Pa. B2	9.85
Joliet,Ill. A7	10.15
KansasCity,Mo. S5	10.10
Kokomo,Ind. C16	10.25
LosAngeles B3	10.65
Minnequa,Colo. C10	10.40
Pittsburg,Calif. C11	10.95
S.Chicago,Ill. R2	9.85
S.SanFrancisco C10	10.65
SparrowsPt.,Md. B2	9.95
Sterling,Ill.(37) N15	10.15

Coil Interim

AlabamaCity,Ala. R2	$9.90
Atlanta A11	10.00
Bartonville,Ill. K4	10.00
Buffalo W12	10.30
Chicago W13	10.20
Crawfordsville,Ind. M8	10.00
Donora,Pa. A7	10.20
Duluth A7	10.20
Fairfield,Ala. T2	10.20
Houston S5	10.15
Jacksonville,Fla. M8	10.46
Johnstown,Pa. B2	9.90
Joliet,Ill. A7	10.20
KansasCity,Mo. S5	10.15
Kokomo,Ind. C16	10.30
LosAngeles B3	10.70
Minnequa,Colo. C10	10.45
Pittsburg,Calif. C11	11.00
S.Chicago,Ill. R2	9.90
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	10.00
Sterling,Ill. (37) N15	10.20

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	.190
Atlanta A11	.192
Bartonville,Ill. K4	.192
Crawfordsville,Ind. M8	.192
Donora,Pa. A7	.196
Duluth A7	.196
Fairfield,Ala. T2	.196
Houston S5	.195
Jacksonville,Fla. M8	.197
Joliet,Ill. A7	.190
KansasCity,Mo. S5	.195
Kokomo,Ind. C16	.198
Minnequa,Colo. C10	.195
Pittsburg,Calif. C11	.220
S.Chicago,Ill. R2	.190
S.SanFrancisco C10	.214
Sterling,Ill. (7) N15	.196
SparrowsPoint,Md. B2	.192
Tonawanda,N.Y. B12	.169
Williamsport,Pa. S19	.175

FENCE POSTS

ChicagoHts.,Ill. C2, I-2	.167
Duluth A7	.167
Franklin,Pa. F5	.167
Huntington,W.Va. W7	.169
Johnstown,Pa. B2	.167
Marion,O. P11	.167
Minnequa,Colo. C10	.172
Sterling,Ill.(1) N15	.167
Tonawanda,N.Y. B12	.169
Williamsport,Pa. S19	.175

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	.184**
Aliquippa,Pa. J5	.181§
Atlanta A11	.190*
Bartonville,Ill. K4	.190
Crawfordsville,Ind. M8	.190
Donora,Pa. A7	.184†
Duluth A7	.184†
Fairfield,Ala. T2	.184†
Houston,Tex. S5	.189**
Jacksonville,Fla. M8	.195
Johnstown,Pa. B2	.188*
Joliet,Ill A7	.184†
KansasCity,Mo. S5	.189**
Kokomo,Ind. C16	.186†
Minnequa,Colo. C10	.189**
Monessen,Pa. P7	.188*
Pittsburg,Calif. C11	.204†
Rankin,Pa. A7	.184†
S.Chicago,Ill. R2	.184**
S.SanFrancisco C10	.204**
SparrowsPoint,Md. B2	190*
Sterling,Ill.(7) N15	.190*

WOVEN FENCE, 9-15 Ga. Col.

Ala.City,Ala. R2	.176**
Aliq'ppa,Pa. 9-14½ga.	J5179§
Atlanta A11	.182*
Bartonville,Ill. K4	.182
Crawfordsville,Ind. M8	.182
Donora,Pa. A7	.176†
Duluth A7	.176†
Fairfield,Ala. T2	.176†
Houston,Tex. S5	.181**
Jacksonville,Fla. M8	.187
Johnstown,Pa.(43) B2	.180*
Joliet,Ill. A7	.176†
KansasCity,Mo. S5	.181**
Kokomo,Ind. C16	.178†
Minnequa,Colo. C10	.181**
Monessen,Pa. 9 ga. P7	.180*
Pittsburg,Calif. C11	.199†
Rankin,Pa. A7	.176†
S.Chicago,Ill. R2	.176**
Sterling,Ill.(7) N15	.182*

WIRE (16 gage)

	An'ld Galv.	Stone
Ala.City,Ala.	R2 15.70	17.25**
Aliq'ppa,Pa.	J5 .15.70	17.50
Bartonville	K4 ..15.80	17.75
Buffalo	W12 ....16.10	....
Cleveland	A7 ...16.00	....
Crawf'dsville	M8 15.80	17.75
Fostoria,O.	S1..16.50	18.05†
Houston	S5 ...15.95	17.50**
Jacksonville	M8 ..16.05	18.00
Johnstown	B2 ..15.70	17.65*
Kan.City,Mo.	S5 15.95	....
Kokomo	C16 ....16.10	17.65†
Minnequa	C10 ..16.25	17.80*
P'lm'r,Mass.	W12 16.30	17.85†
Pitts.,Calif.	C11 .16.35	17.90†
SparrowsPt.	B2 .15.80	17.75*
Sterling(37)	N15 16.00	17.95*
Waukegan	A7 ..16.00	17.55†
Worcester	A7 .16.30	....

WIRE, Merchant Quality

	(6 to 8 gage)	An'ld Galv.
Ala.City,Ala.	R2	7.95 8.35**
Aliquippa	J5	....7.95 8.475§
Atlanta	(48) A11	8.05 8.65*
Bartonville	(48) K4	.8.05 8.65
Buffalo	W12	....8.20 8.75†
Cleveland	A7	....8.20 ....
Crawfordsville	M8	.8.05 8.65
Donora,Pa.	A7	.8.20 8.75†
Duluth	A7	.8.20 8.75†
Fairfield	T2	.8.20 8.75†
Houston	(48) S5	.8.20 8.60**
Jacks'ville,Fla.	M8	8.30 8.90
Johnstown	B2(48)	8.20 8.95*
Joliet,Ill.	A7	....8.20 8.75†
Kans.City	(48) S5	8.20 8.60**
Kokomo	C16	....8.30 8.85†
LosAngeles	B3	...8.90 9.50*
Minnequa	C10	...8.45 9.00‡
Monessen	P7(48)	.7.95 8.55*
Palmer,Mass.	W12	8.50 9.05†
Pitts.,Calif.	C11	..9.15 9.70†
Rankin,Pa.	A7	...8.20 8.75†
S.Chicago	R2	...7.95 8.35**
S.SanFran.	C10	8.90 9.30**
Spar'wsPt.	B2(48)	8.30 9.05*
Sterling(37)	(48)N15	8.35 9.10
Struth'rs,O.	(48)Y1	7.95 8.45‡
Worcester,Mass.	A7	8.50 9.05†

Based on zinc price of: *13.50c. †5c. ‡10c. ‡Less than 10c. ††13c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts
Full Size Body (cut thread)

½ in. and smaller:	
6 in. and shorter	52.5
Lower than 6 in.	43.5
⅝ in. thru 1 in:	
6 in. and shorter	43.5
Longer than 6 in.	41.5
1⅛ in. and larger:	
All lengths	41.5
Undersized Body (rolled thread)	
½ in. and smaller:	
6 in. and shorter	52.5

Carriage, Machine, Lag Bolts
Hot Galvanized:

½ in. and smaller:	
6 in. and shorter	32.0
Longer than 6 in.	19.0
⅝ in. thru 1 in.:	
6 in. and shorter	16.0
Longer than 6 in.	16.0
1⅛ in. and larger:	
All lengths	16.0

Lag Bolts
All diameters:

6 in. and shorter	52.5
Longer than 6 in.	44.5

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter	52.0
Larger than ½ in. or longer than 6 in.	44.5

Blank Bolts 44.5
Step, Elevator, Tire Bolts 52.0
Stove Bolts, Slotted

⅛ to ¼-in., incl., 3 in. and shorter	54.00
7/32 to ½-in., inclusive	54.00

NUTS

Reg. & Heavy Square Nuts:
All sizes 58.0
Square Nuts, Reg. & Heavy, Hot Galvanized:
All sizes 44.0
Hex Nuts, Reg. & Heavy, Hot Pressed:

⅜ in. and smaller	61.5
⅞ in. to 1 in., incl.	57.5
1⅛ in. to 1½ in., incl.	62.5
1⅝ in. and larger	56.0

Hex Nuts, Reg. & Heavy, Cold Punched:

⅜ in. and smaller	61.5
⅞ in. to 1½ in., incl.	57.5
1⅝ in. and larger	56.0

Hex Nuts, All Types, Hot Galvanized:

⅜ in. and smaller	48.0
⅞ in. to 1 in., incl.	44.0
1⅛ in. to 1½ in., incl.	49.0

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

⅜ in. and smaller	61.5
⅞ in. to 1½ in., incl.	57.5
1⅝ in. and larger	56.0

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller	64.00
1⅛ in. to 1½ in., incl.	60.5
1⅝ in. and larger	56.0

Semifinished Hex Nuts, Reg. (Including Slotted):

⅝ in. and smaller	61.5
¾ in. to 1-in., incl.	64.0
1⅛ in. to 1.5-in., incl.	60.5
1⅝ in. and larger	56.0

CAP AND SET SCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:
6 in. and shorter:

⅝ in. and smaller	44.0
¾, ⅞ and 1 in diam.	27.0

Longer than 6 in.:

⅝ in. and smaller	14.0
¾, ⅞ and 1 in. diam.	0.5

High Carbon, Heat Treated:
6 in. and shorter:

⅝ in. and smaller	31.0
¾, ⅞ and 1 in. diam.	9.0

Longer than 6 in.:

⅝ in. and smaller	+6
¾, ⅞ and 1 in. diam.	+24

Flat Head Cap Screws:

¾ in. and smaller	+65.0

Set Screws, Square Head, Cup Point, Coarse Thread
Through 1 in. diam.:

6 in. and shorter	11
Longer than 6 in.	+10

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½-in., larger 11.50
1/16-in. under List less 23%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	24.55	22.84
1¼	13	....	29.07	22.68
1½	13	27.45	32.14	25.08
1¾	13	32.43	37.97	29.64
2	13	36.34	42.56	33.21
2¼	13	40.93	47.94	37.42
2½	12	44.42	52.03	40.61
2½	12	48.94	57.31	44.73
2¾	12	52.99	62.05	48.44
3	12	56.51	66.18	51.66

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	5.275	5.175	5.225	6.25
Ensley,Ala. T2	5.275	5.175	....	6.25
Fairfield,Ala. T2	....	....	....	6.25
Huntington,W.Va. C15	....	....	....	6.25
Gary,Ind. U5	5.275	5.175	5.225	....
IndianaHarbor,Ind. I-2	5.275	5.175	5.225	....
Johnstown,Pa. B2	....	....	....(16)	6.25
Lackawanna,N.Y. B2	5.275	5.175	....	6.25
Minnequa,Colo. C10	5.275	5.175	....	6.75
Steelton,Pa. B2	5.275	5.175	....	....
Williamsport,Pa. S19	....	....	....	6.15

TIE PLATES

Fairfield,Ala. T2	6.275
Gary,Ind. U5	6.275
Ind.Harbor,Ind. I-2	6.275
Lackawanna,N.Y. B2	6.275
Minnequa,Colo. C10	6.275
Seattle B3	6.175
Steelton,Pa. B2	6.275
Torrance,Calif. C11	6.425

JOINT BARS

Bessemer,Pa. U5	6.60
Fairfield,Ala. T2	6.60
Ind.Harbor,Ind. I-2	6.60
Joliet,Ill. U5	6.60
Lackawanna,N.Y. B2	6.60
Minnequa,Colo. C10	6.60
Steelton,Pa. B2	6.60

AXLES

Ind.Harbor,Ind. S13	8.35
Johnstown,Pa. B2	8.35

TRACK BOLTS, Untreated

Cleveland R2	13.85
KansasCity,Mo. S5	13.10
Lebanon,Pa. B2	13.85
Minnequa,Colo. C10	13.85
Pittsburgh P14	13.10
Seattle B3	13.60

SCREW SPIKES

Lebanon,Pa. B2	13.60
Pittsburgh P14	12.85

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.225
Ind.Harbor,Ind. I-2,Y1	9.225
KansasCity,Mo. S5	8.775
Lebanon,Pa. B2	9.225
Minnequa,Colo. C10	9.225
Pittsburgh J5	9.225
Seattle B3	9.275
S.Chicago,Ill. R2	9.225
Struthers,O. Y1	9.225
Youngstown R2	9.225

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼ to under 1 7/16 in.: 1 7/16 to under 1 5/16 in.: 6.23c; 1 15/16 to 8 in.: inclusive, 6.60c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality: add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.685c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝-in.; 7.30c, for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(48) 6-7 Ga.
(49) 3½-in. and smaller rounds; 8.65c, over 3½-in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+5.25	+23.25	1.25	+17.5	3.75	+15	5.25	+13.5	5.25	+13.5	5	+13.75	7.5	+11.25
Ambridge, Pa. N2	+5.25	....	1.25	....	3.75	....	5.25	....	5.25	....	5	....	7.5	....
Lorain, O. N3	+5.25	+23.25	1.25	+17.5	3.75	+15	5.25	+13.5	5.25	+13.5	5	+13.75	7.5	+11.25
Youngstown Y1	+2.75	+20.75	1.25	+17.5	3.75	+15	5.25	+13.5	5.25	+13.5	5	+13.75	7.5	+11.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+5.25	+23.25	1.25	+17.5	3.75	+15	5.25	+13.5	5.25	+13.5	5	+13.75	7.5	+11.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	9.25	+10	12.25	+6	15.75	+1.5	18.25	0.25
Alton, Ill. L1	....	....	....	....	....	....	7.25	+12	10.25	+8	13.75	+3.5	16.25	+1.75
Benwood, W. Va. W10	6.5	+24	+4.75	+32.25	+14.75	+42.25	9.25	+10	12.25	+6	15.75	+1.5	18.25	0.25
Butler, Pa. F6	7.5	+23	+3	+30.5	+12.5	+40	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	9.25	+19	12.25	+6	15.75	+1.5	18.25	0.25
Fairless, Pa. N3	....	....	....	....	....	....	7.25	+12	10.25	+8	13.75	+3.5	16.25	+1.75
Fontana, Calif. K1	....	....	....	....	....	....	+3.75	+23	+0.75	+19	2.75	+14.5	5.25	+12.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	8.25	+11	11.25	+7	14.75	+2.5	17.25	+0.75
Lorain, O. N3	....	....	....	....	....	....	9.25	+10	12.25	+6	15.75	+1.5	18.25	0.25
Sharon, Pa. S4	7.5	+23	+3	+30.5	+12.5	+40	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	9.25	+10	12.25	+6	15.75	+1.5	18.25	0.25
Sparrows Pt., Md. B2	5.5	+25	+0.5	+32.5	+14.5	+42	7.25	+12	10.25	+8	13.75	+3.5	16.25	+1.75
Wheatland, Pa. W9	7.5	+23	+3	+30.5	+12.5	+40	9.25	+10	12.25	+6	15.75	+1.5	18.25	0.25
Youngstown R2, Y1	....	....	....	....	....	....	9.25	+10	12.25	+6	15.75	+1.5	18.25	0.25

Size—Inches	1¼		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	18.75	1.25	19.25	1.75	20.75	2.5	20.75	2.5	....	....	....	....
Alton, Ill. L1	16.75	+0.75	17.25	+0.25	18.75	0.5	18.75	0.5	....	....	....	....
Benwood, W. Va. W10	18.75	1.25	19.25	1.75	20.75	2.5	20.75	2.5	10.25	+8.5	10.25	+8.5
Etna, Pa. N2	18.75	1.25	19.25	1.75	20.75	2.5	20.75	2.5	10.25	+8.5	10.25	+8.5
Fairless, Pa. N3	16.75	+0.75	17.25	+0.25	18.75	0.5	18.75	0.5	8.25	+10.5	8.25	+10.5
Fontana, Calif. K1	5.75	+11.75	6.25	+11.25	7.75	+10.5	7.75	+10.5	+2.75	+21.5	+2.75	+21.5
Indiana Harbor, Ind. Y1	17.75	0.25	18.25	0.75	19.75	1.5	19.25	1.5	9.25	+9.5	9.25	+9.5
Lorain, O. N3	18.75	1.25	19.25	1.75	20.75	2.5	20.75	2.5	....	....	....	....
Sharon, Pa. M6	18.75	1.25	19.25	1.75	20.75	2.5	20.75	2.5	....	....	....	....
Sparrows Pt., Md. B2	16.75	+0.75	17.25	+0.25	18.75	0.5	18.75	0.5	8.25	+10.5	8.25	+10.5
Wheatland, Pa. W9	18.75	1.25	19.25	1.75	20.75	2.5	20.75	2.5	10.25	+8.5	10.25	+8.5
Youngstown R2, Y1	18.75	1.25	19.25	1.75	20.75	2.5	20.75	2.5	10.25	+8.5	10.25	+8.5

*Galvanized pipe discounts based on current price of zinc (13.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	21.25	26.00	....	34.50	....	40.50	42.50	46.75	43.25
202	22.75	29.00	35.00	37.50	39.25	41.25	43.25	47.25	47.25
301	22.25	27.00	35.75	35.75	40.25	42.50	44.50	49.25	45.75
302	24.25	30.25	36.50	39.00	41.00	43.25	45.50	50.00	50.00
302B	24.50	31.50	39.25	44.00	43.25	45.50	47.50	54.75	54.75
303	....	30.75	39.50	....	44.00	46.25	48.00	54.50	54.50
304	26.00	32.00	39.00	42.50	43.75	46.00	48.75	53.25	53.25
304L	....	....	46.50	49.50	51.25	53.50	56.25	60.75	60.75
305	27.50	35.25	40.75	45.75	43.75	46.00	49.25	56.50	56.50
308	29.50	36.75	45.50	48.25	50.75	53.50	58.00	60.50	60.50
309	38.25	47.50	55.50	62.00	61.25	64.50	68.25	77.50	77.50
310	47.75	59.25	75.00	81.00	83.25	87.50	89.25	93.00	93.00
314	....	....	....	....	83.25	....	80.25	....	100.50
316	38.25	47.50	59.75	66.50	66.75	70.25	73.75	78.25	78.25
316L	....	....	67.25	73.00	74.25	77.75	81.25	85.75	85.75
317	46.25	57.75	73.75	84.75	83.00	87.25	90.00	97.00	97.00
321	31.00	38.50	45.25	51.50	50.50	53.25	57.50	63.00	63.00
18-8 CbTa	35.50	44.75	53.50	61.00	59.25	62.25	67.00	76.25	76.25
403	....	....	30.75	....	34.50	36.25	38.75	46.50	46.50
405	18.75	24.50	28.50	34.50	32.50	34.00	36.00	45.00	45.00
410	16.00	20.75	27.25	29.75	31.00	32.50	33.75	38.75	38.75
416	....	....	27.75	....	31.50	33.00	34.75	46.50	46.50
420	....	32.25	33.00	40.25	37.75	39.75	43.50	59.50	59.50
430	16.25	21.00	27.75	30.75	31.50	33.00	34.50	39.25	39.25
430F	....	....	28.25	....	32.00	33.50	35.25	49.75	49.75
431	....	27.75	36.25	....	40.50	42.50	44.25	53.75	53.75
446	....	....	37.75	56.75	42.50	44.75	46.00	67.25	67.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Div., H. K. Porter Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U.S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; National-Standard Co.; National Tube Div., U.S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	35.50
304	33.15	36.20	40.30	44.50	37.75
304-L	35.40	38.80	43.15	47.65	....
316	38.35	41.60	45.90	50.15	55.50
316-L	43.55	47.60	52.70	57.85	....
316-Cb	43.85	48.10	53.40	58.75	....
321	34.90	37.95	42.10	46.40	44.75
347	37.05	41.25	46.45	51.70	54.25
405	27.55	29.20	33.15	37.05	....
410	27.00	28.70	32.65	36.55	....
430	27.00	28.70	32.65	36.55	....
Inconel	47.28	57.90	68.50	79.20	....
Nickel	40.00	50.30	60.65	71.05	....
Nickel, Low Carbon	40.30	50.95	61.65	72.50	....
Monel	41.70	51.90	62.15	72.40	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.00	39.85

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.290	Cr Hot Work	0.45-0.495
Extra Carbon	0.345	W-Cr Hot Work	0.43-0.475
Special Carbon	0.41-0.45	V-Cr Hot Work	0.460
Oil Hardening	0.450	Hi-Carbon-Cr	0.830

Grade by Analysis (%) W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	....	....	4.170
18.25	4.25	1	4.75	....	....	2.385
18	4	2	9	....	....	2.755
18	4	2	....	....	....	1.845
18	4	1	....	....	....	1.680
9	3.5	..	....	....	....	1.275
13.5	4	3	....	....	....	1.945
13.75	3.75	2	5	....	....	2.325
6.4	4.5	1.9	....	5	....	1.185
6	4	3	....	6	....	1.430
1.5	4	1	....	8.5	....	1.040

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
AlabamaCity,Ala. R2	58.50	59.00	....	....
Birmingham R2	58.50	59.00‡	....	....
Birmingham U6	....	59.00‡	63.00	....
Woodward,Ala. W15	58.50**	59.00‡	63.00	....
Cincinnati, deld.	....	66.70	....	....
Buffalo District				
Buffalo H1, R2	64.50	65.00	65.50	66.00
Tonawanda,N.Y. W12	64.50	65.00	65.50	66.00
N.Tonawanda,N.Y. T9	....	65.00	65.50	66.00
Boston, deld.	75.79	76.29	76.79	....
Rochester,N.Y., deld.	67.52	68.02	68.52	....
Syracuse,N.Y., deld.	68.62	69.12	69.62	....
Chicago District				
Chicago I-3	64.50	65.00	65.00	65.50
S.Chicago,Ill. R2	64.50	....	65.00	....
S.Chicago,Ill. Y1	64.50	65.00	65.00	....
S.Chicago,Ill. W14	64.50	....	65.00	65.50
Milwaukee, deld.	66.96	67.46	67.46	67.96
Muskegon,Mich., deld.	....	78.83	78.83	....
Cleveland District				
Cleveland R2, A7	64.50	65.00	65.00	65.50
Akron,O., deld.	67.62	68.12	68.12	68.62
Mid-Atlantic District				
Birdsboro,Pa. B10	66.50	67.00	67.50	68.00
Chester,Pa. P4	66.50	67.00	67.50	....
Swedeland,Pa. A3	66.50	67.00	67.50	68.00
New York, deld.	....	73.20	73.70	....
Newark,N.J., deld.	70.52	71.02	71.52	72.02
Philadelphia, deld.	68.38	68.88	69.38	69.88
Troy,N.Y. R2	66.50	67.00	67.50	68.00
Pittsburgh District				
NevilleIsland,Pa. P6	64.50	65.00	65.00	65.50
Pittsburgh (N&S sides), Aliquippa, deld.	....	66.45	66.45	66.98
McKeesRocks,Pa., deld.	....	66.10	66.10	66.63
Lawrenceville, Homestead, Wilmerding,Monaca,Pa., deld	....	66.76	66.76	67.29
Verona,Trafford,Pa., deld.	66.79	67.32	67.32	67.85
Brackenridge,Pa., deld.	67.10	67.60	67.60	68.13
Midland,Pa. C18	64.50	....	....	....

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Youngstown District				
Hubbard,O. Y1	....	....	65.00	....
Sharpsville,Pa. S6	64.50	....	65.00	65.50
Youngstown Y1	....	....	65.00	65.50
Mansfield,O., deld.	69.40	....	69.90	70.40
Duluth I-3	64.50	65.00	65.00	65.50
Erie,Pa. I-3	64.50	65.00	65.00	65.50
Everett,Mass. E1	66.00	66.50	67.00	....
Fontana,Calif. K1	70.50	71.00	....	....
Geneva,Utah C11	64.50	65.00	....	....
GraniteCity,Ill. G4	66.40	66.90	67.40	....
Ironton,Utah C11	64.50	65.00	....	....
Minnequa,Colo. C10	66.50	67.00	67.50	....
Rockwood,Tenn. T3	....	59.00‡	63.00	....
Toledo,O. I-3	64.50	65.00	65.00	65.50
Cincinnati, deld.	71.04	71.54	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.60%, $59.50.
‡Phos. 0.70-0.90%; Phos. 0.30-0.50%, $60.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extras; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,O. I-3, J1	77.25
Buffalo H1	78.50

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity, Ky. P15	$105.50
NiagaraFalls,N.Y. P15	105.50
Keokuk,Iowa, Open-hearth & Fdry, freight allowed K2	110.00
Keokuk, H.O. & Fdry. 12½ lb piglets, 16% Si. frgt allowed K2	113.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	78.50
Troy,N.Y. R2 (Phos. 0.035% max)	72.50
Philadelphia, deld.	80.26
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	69.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	69.50
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	69.50
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	69.50

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Houston, Seattle no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.$	H.R. Alloy 4140††		Carbon	Floor
Atlanta	8.17§	9.37§	9.83§	....	8.21	8.45	10.23	....	8.59	8.55	10.51
Baltimore	7.88	8.98	9.12	....	8.36	8.53	9 13[8]	14.68	8.75	8.26	9.76
Birmingham	7.80	9.00	9.52	....	7.82	8.07	10.12	....	8.20	8.16	10.31
Boston	8.84	9.88	11.06	60.42	8.89	9.07	....	14.69	9.10	9.18	10.68
Buffalo	7.85	9.00	10.75	....	8.05	8.25	8.70	14.50	8.50	8.50	10.05
Chattanooga	7.99	9.24	9.10	....	8.00	8.24	10.04	....	8.44	8.40	10.26
Chicago	7.80	9.00	9.70	53.25	7.82	8.07	8.35	14.15	8.20	8.16	9.49
Cincinnati	7.94	9.05	9.75	50.00	8.14	8.38	8.84	14.46	8.74	8.52	9.78
Cleveland	7.78	8.98	9.60	53.43	7.92	8.16	8.60	14.24	8.57	8.39	9.72
Denver	9.55	11.09	12.41	....	9.70	9.75	10.54	18.89	9.60	9.50	11.15
Detroit	8.03	9.25	10.05	59.50	8.17	8.37	8.70	14.41	8.74	8.51	9.74
Erie, Pa.	7.85	9.00	9.60[10]	....	7.95	8.20	8.70[10]	....	8.50	8.35	9.75
Houston	8.70	9.65	10.99	....	8.80	9.15	10.55	15.00	8.90	8.60	10.10
Jackson, Miss.	8.09	9.34	9.79	....	8.16	8.41	10.23	....	8.54	8.50	10.34
Los Angeles	9.10	10.80	11.65	57.45	9.15	9.05	12.10	15.50	9.15	9.65	11.80
Milwaukee	7.93	9.13	9.83	....	7.95	8.20	8.58	14.28	8.41	8.29	9.62
Moline, Ill.	8.05	9.25	10.05	....	8.13	8.26	8.70	....	7.78	8.36	...
New York	8.45	9.66	10.23	60.20	8.90	9.01	....	14.59	8.91	9.01	10.31
Norfolk, Va.	8.05	...	....	....	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.15	9.07	10.29	50.69	8.82	8.71	9.31	14.51	8.70	8.68	9.70
Pittsburgh	7.78	8.99	10.05	50.00	7.92	8.07	8.35	14.15	8.20	8.16	9.49
Portland, Oreg.	8.90	9.65	11.40	55.20	11.05‡‡	9.35	13.80	14.60	9.35	12.20§§	11.60
Richmond, Va.	8.00	...	10.14	....	8.55	8.40	10.00	....	8.95	8.40	9.90
St. Louis	8.14	9.34	10.06	73.36	8.19	8.43	8.96	14.51	8.67	8.52	9.86
St. Paul	8.29	9.49	10.31	....	8.43	8.52	9.21	....	8.94	8.90	9.87
San Francisco	9.05	10.40	10.90	53.45	9.05	9.15	12.55	15.60	9.15	9.30	11.55
Seattle	9.55	10.70	11.65	55.20	9.55	9.50	13.40	15.85	9.35	9.30	11.70
Spokane, Wash.	9.55	10.70	11.65	....	9.55	9.50	13.40	16.60	9.35	9.30	11.70
Washington	8.48	9.58	....	....	9.06	9.13	9.73	....	9.35	8.86	10.36

*Prices do not include gage extras; †prices include gage and coating extras (based on 12.50c zinc at Los Angeles and 13.50c at other points), except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; §42 in. and under; **⅛-in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [8]—400 to 999 lb; [9]—1000 to 1999 lb; [9]—2000 to 3999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beach Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, O., $138; Cutler, Utah, $165.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $150; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Hays, Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $145; Woodbridge, N. J., $128; Philadelphia, $130.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $100; Clearfield, Pa., Portsmouth, O., $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Pa., Orviston, Pa., $305.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Pa., Orviston, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reasdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $16; Thornton, McCook, Ill., $16.35; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½-in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜-in. grains with fines: Baltimore, $72.40.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $38-39; 70%, $35-36; 60%, $31-32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34; Mexican, $26.50.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge iron:	
Swedish, c.i.f. Camden, N.J., c.l. in bags	8.50
Domestic:	
F.o.b., Johnstown, Pa., Niagara Falls, N. Y., in bags	9.50
F.o.b., Riverton, N. J., in bags	8.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	26.00
Annealed, 99.5% Fe.	36.50
Unannealed (99+ % Fe)	34.00
Unannealed (99+ % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron:	
98.1-99.9%, 3 to 20 microns, depending on grade, 99.00-290.00, in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500 lb drum, frght allowed	
Carlots	38.20
Ton lots	40.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	35.80-45.00†
Bronze, 5000-lb lots	44.70-59.00†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.065
Nickel-Silver, 5000-lb lots	54.70-66.40†
Phosphor-Copper, 5000-lb lots	64.00
Copper (atomized) 5000-lb lots	46.50-54.00‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.08
Stainless Steel, 316	$1.44
Tin	14.50*
Zinc, 5000-lb lots	19.75-33.00‡
Tungsten:	Dollars
Melting grade, 99%	
60 to 2000 mesh:	
1000 lb and over	4.20
Less than 1000 lb.	4.35
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni. **64% Cu, 18% Zn, 18% Ni.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

——Inches—— Diam.	Length	Per 100 lb
2	24	$57.75
2½	30	37.25
3	40	35.25
4	40	33.25
5⅛	40	33.00
6	60	30.00
7	60	28.75
8, 9, 10	60	28.50
12	72	25.50
14	60	25.50
16	72	24.50
17	60	25.50
18	72	24.50
20	72	24.00
24	84	24.75

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$7.15	$7.15	$7.15	$7.40
Bar Size Angles	7.11	7.11	7.11	7.26
Structural Angles	7.30	7.30	7.30	7.60
I-Beams	7.50	7.50	7.50	7.75
Channels	7.70	7.70	7.70	7.95
Plates (basic bessemer)	9.00	9.00	9.00	9.30
Sheets, H.R.	8.55	8.55	8.55	8.85
Sheets, C.R. (drawing quality)	8.95	8.95	8.95	9.35
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	27.17	27.17	27.17	27.64
Barbed Wire (†)	6.90	6.90	6.90	7.35
Merchant Bars	7.15	7.15	7.15	7.50
Hot-Rolled Bands	7.25	7.25	7.25	7.65
Wire Rods, Thomas Commercial No. 5	6.38	6.38	6.38	6.78
Wire Rods, O-H Cold Heading Quality No. 5	6.72	6.72	6.72	7.12
Bright Common Wire Nails (‡)	8.45	8.45	8.45	8.57

Oil Country Pipe: Mills withdrawn temporarily.

†Per 82-lb, net, reel. ‡Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross tons, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old range bessemer	11.85
Old range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	27.00-27.50
N. African hematite (spot) nom.	24.00-25.00
Brazilian iron ore, 68-69%	35.00-36.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$24.00-26.00
Domestic, concentrates, mine	55.00

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.60-1.70 per long ton unit, c.i.f. U.S. ports, duty for buyer's account; other than Indian, $1.45-1.50; contracts by negotiation.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$54.00-57.00
48% 2.8:1	51.00-54.00
48% no ratio	43.00-45.00

South African Transvaal

48% no ratio	$37.50-39.00
44% no ratio	26.00-27.00

Turkish

48% 3:1	$60.00-63.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard	
55-60%	$3.20-3.65
60-65%	3.60-3.80

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.75-15.75
Connellsville, foundry	17.50-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	33.78
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, deld.	32.25
Saginaw, deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens	
New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, O., ovens	25.00
Cincinnati, deld.	29.27
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Painesville, O., ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
Neville Island (Pittsburgh), Pa., ovens	29.25
St. Paul, ovens	29.75
Chicago, deld.	33.14
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.80 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton; $225, Johnstown, Duquesne, Sheridan, Pa., Alloy W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74% respectively.

(Mn 79-81%). Lump $263 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Grade Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 33c; 2000 lb to min carload, 35c; 500 lb to 1999 lb, 37c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk, 27.75c per lb of contained Cr; c.l. packed 29.3c, ton lot 31.05c; less ton 32.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 34.75c per lb contained Cr, 0.02% max 41.5c, 0.03% max 41c, 0.06% max 39.5c, 0.1% max 39c, 0.15% max 38.75c, 0.2% max 38.5c, 0.5% max 38.25c, 1.0% max 37.5c, 1.5% max 37.35c, 2.0% max 37.25c. Ton lot, add 3.4c, less ton add 5.1c. Carload packed add 1.75c. Delievered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 29.05c per lb contained Cr. Packed, c.l. 30.65c, ton 32.45c, less ton 33.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 20.85c, per lb of alloy, ton lot 22.10c; less ton lots 23.3c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 41.35c per lb of contained Cr; 1" x down, bulk 42.35c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 13c per lb of contained Si. Packed c.l. 15.5c, ton lot 16.95c, less ton 18.6c, f.o.b. Alloy, W. Va., Ashtabula, Marietta, O., Sheffield, Ala., and Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot, 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 2% Fe grade analyzing min 96.5% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy, ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5%-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carload 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅜ lb each and containing 2 lb of Cr). Contract, carload, bulk, 19c per lb of briquet, carload packed in box pallets 19.2c, in bags 20.1c; 3000 lb to c.l. in box pallets 20.4c; 2000 lb to c.l. in bags, 21.3c; less than 2000 lb in bags 22.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l. pallets 16.2c; 2000 lb to c.l. bags, 17.2c, less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk, 7.7c per lb of briquet, packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l. bags 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $3.15 per lb of contained W; 2000 lb W to 5000 lb W, $3.25; less than 2000 lb W, $3.37. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.50 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.95 per lb of contained Cb plus Ta, delivered; less ton lot $5.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 19c per lb of alloy, ton lot 20.15c, less ton 21.4c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5.7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy; (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

ASK ABOUT

MICCROSOL

for Corrosion Resistant

Coatings on Tanks,

Ducts, Housings, Racks, etc.

MICHIGAN CHROME
and Chemical Company

8615 GRINNELL AVENUE
DETROIT 13, MICHIGAN

MASTER MAKERS OF
FINE BEARING METALS
SINCE 1860

A. W. Cadman Mfg. Co.

28th and SMALLMAN STS., PITTSBURGH 22, PA.

INTRODUCTION TO THE STUDY OF
HEAT TREATMENT OF METALLURGICAL PRODUCTS

By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

246 pages 4 tables
69 Illustrations Price $5.00 Postpaid

THE PENTON PUBLISHING CO.

Book Department, 1213 W. 3rd St., Cleveland 13, O.

Why cast...forge...or hog it...
if you can do it better with a
DRESSER WELDMENT?

Autoclave's all-welded construction eliminates rivets, other sources of leakage. Monel weldments effect substantial savings in fabrication.

If you have angle or channel shaped rings in circular assemblies that are hard to make and subject to high rejections, they can probably be made better and cheaper with Dresser Weldments.

Contour bars—extruded or shaped by specially designed mill rolls—leave a minimum of excess stock for finishing. Formed, automatically flash-welded and expanded to accurate dimensions, many special-shaped parts and rings need little or no machining. Often, savings on end scrap alone pay for the finished part.

Typical Dresser Weldments

- *Rings and Cylinders*—circular elements may also be combined into composite weldment.
- *Hot-Formed Circular Parts* — extensive banks of presses and furnaces offer you economies in volume production.
- *Shafts or Circular Parts Welded from Dissimilar Metals* — available with a portion of the part resistant to heat, corrosion or abrasion—or provided with greater strength or hard surface in a localized section.

We'll gladly make recommendations at no cost to you. Just send us your sketch or print.

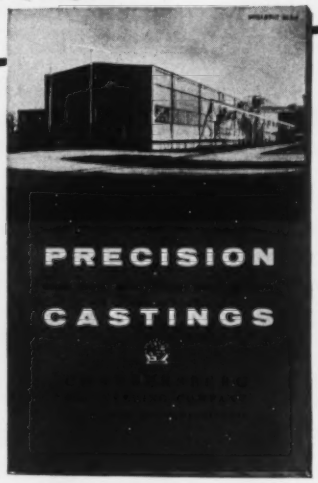
ONE OF THE DRESSER INDUSTRIES

DRESSER WELDMENTS

Dresser Manufacturing Division

119 FISHER AVENUE • BRADFORD, PA.

Do you require large castings of high quality?



Send for this new booklet on Chambersburg's modern foundry and the cement-bonded sand castings produced there. As a result of the accuracy and excellent quality of these castings, marked reductions in finish machining is often possible.

CHAMBERSBURG
ENGINEERING COMPANY
"THE HAMMER BUILDERS"
563 Derbyshire St. Chambersburg, Pa.

If
METALWORKING PLANTS ARE YOUR PROSPECTS . . .

✔ STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business.

✔ Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.

STEEL TUBING
SEAMLESS or WELDED
AIRCRAFT · MECHANICAL
PRESSURE · STAINLESS
STAINLESS PIPE & FITTINGS
SERVICE STEEL
DETROIT · BUFFALO · CHICAGO · CINCINNATI · LOS ANGELES

MODERN ELECTROPLATING
563 PAGES
ILLUSTRATED
Price $9.50 Postpaid

BY ALLEN G. GRAY, Technical Editor, STEEL Magazine.

Brings you a complete, up-to-date one-volume summary of current industrial electroplating processes. The only book that emphasizes both practical aspects and basic theory. The Penton Publishing Company, Book Department, 1213 West Third St., Cleveland 13, Ohio.

ELIMINATE YOUR PROBLEMS!
COMPLETE DESIGN-AND-BUILD SERVICE.

● Tools, dies, jigs, gages, fixtures or special machinery. We'll work from idea, blueprint or sample part. Complete engineering service, experienced machinists. Prompt quotations.

Also METAL PRODUCTION CAPACITY

● For long or short production runs of large or small parts. Complete facilities including Profilometer Duplicators, Presses up to 450 tons, Planers up to 20 ft. stroke, Radial Drill Presses up to 8 ft., Lathes up to 158" c. c., Boring Mills up to 120" bed, Milling Machines, Grinders, etc.

Inquiries invited on individual or contract basis.

PIVOT PUNCH & DIE CORPORATION
North Tonawanda, N. Y. Phone JA 1200

COES KNIFE COMPANY
Precision Ground Machine Ways
Hardened tool steel ways, guides, and special wear plates, inseparably forge welded to tough, machineable backings. Hardness, shapes, dimensions, and mounting holes to your specifications.

For quotations, send sketches of your requirements to:
COES KNIFE COMPANY, 66 COES ST., WORCESTER, MASS.

MACHINE KNIVES
Standard and special blades of solid or composite steel, for all machine knife applications.

COES MICRO GROUND

Limited Buying Depresses Scrap

Price decline is uninterrupted. Composite on steelmaking grades drops to $45. Further decline in steel production contributes gloomy note in sluggish market

Scrap Prices, Page 162

Pittsburgh—Activity is restricted to scattered purchases of "spot" tonnage. Purchasing agents have acquired small amounts of No. 1 heavy melting at $44 per ton, off $3 in a week. Scrap collections are slowing up. Cast iron and railroad grades have dropped between $3 and $5 in the past week.

Philadelphia—With mill buying light, steel scrap prices are off an average of $2 a ton on the prime grades. No. 1 heavy melting is bringing $50. Shipments of borings and turnings are small, and sales are nil, with prices lower and nominal. Buying for export will pick up this month—two, possibly three, vessels will be loaded. Railroad scrap is off $3 a ton, though short rails are down only $2.

New York—Steelmaking scrap prices continue to sag. No. 1 heavy melting is off $2 a ton, with brokers paying $43-$44. The No. 2 grades are also down, and a decline in borings and turnings ranges up to $5 a ton. The cast iron grades are steadier, although unstripped motor blocks are off $1. Low phos structurals and plates are down $5. The lower prices reflect light buying by eastern mills. Export demand is reported improved for dock delivery.

Cleveland — Continued sluggishness in demand from steel mills is accompanying a gradual slackening in steelmaking operations. Expectations are prices on the steelmaking grades will go lower before a turn in the market develops. Dealers' yard accumulations are not excessive, and the steady lowering in prices is seen discouraging collection by peddlers. Industrial scrap lists are setting the market pace in this area.

Detroit—Automotive lists closed lower, bringing No. 1 heavy melting steel down to a range of $35-$36, brokers' buying prices. Local mills aren't buying now, and dealers are wondering when the bottom of the decline will be reached. A couple of brokers here claim they'll put down scrap at $34. The feeling prevails that the market eventually will level out around $40. Canadian demand, according to one dealer, is the only factor supporting the local market. The cast iron grades continue strong.

Chicago—Scrap dropped $1 to $4 a ton here last week in one of the sharpest breaks the market has taken since prices hit the skids early in January. No. 1 heavy melting steel of industrial origin is now $25 below last December's record high of $68 a gross ton. Last week's price decline affected all grades of melting material, with the sharpest breaks in open hearth and railroad grades—the least in blast furnace and cast items. The market continues soft, with buyers able to get all they want at present levels. But purchases are on the light side. Prices on stainless scrap also have skidded sharply.

Buffalo—Price declines ranging up to $5 a ton on the various steel mill grades of scrap were posted here last week. Dealers await placement of April delivery contracts. There is virtually no buying. Specialty grades are expected to follow the steel mill grades downward. Demand for cast scrap by the foundries is slow.

Youngstown—Signs of further weakness are appearing in the scrap market here. Observers look for prices to slip another $2 to $3 a ton when new orders come out. This should bring No. 1 heavy melting down to $44-$45; No. 2 heavy melting to around $41; and No. 2 bundles to $36-$37.

Reduced bessemer operations is giving local mills larger quantities of hot metal for open hearth furnace operations.

Boston—Heavy melting steel

(*Please turn to page* 168)

ALL-HYDRAULIC!
SILENT HOIST
KRANE KAR
HYDRAULIC
Boom Swinging
Boom Topping
Boom Telescoping
Load Hoisting
Originator and leader in its class for 30 years, KRANE KAR goes ALL-HYDRAULIC. Affords amazing ease of handling... touch control of all crane operations... with other engineering advances that simplify operator's work... eliminating gear shifting and clutch replacements... cutting maintenance to the bone and setting new standards of efficiency and productivity. Get the details. Write, wire, telephone today.
FLUID DRIVE
POWER STEERING
KRANE KAR
MODELS 1000 TO 25,000 LBS. CAP.
SILENT HOIST & CRANE CO.
Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment
849 63rd Street, Brooklyn 20, N. Y.

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Apr. 3, 1957. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Apr. 3	$45.00
Mar. 27	47.67
Mar. Avg	49.63
Apr. 1956	54.90
Apr. 1952	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*43.00-44.00*
No. 2 heavy melting	*36.00-37.00*
No. 1 bundles	*43.00-44.00*
No. 2 bundles	*34.00-35.00*
No. 1 busheling	*43.00-44.00*
Machine shop turnings	*31.00-32.00*
Mixed borings, turnings	*31.00-32.00*
Short shovel turnings	*35.00-36.00*
Cast iron borings	*35.00-36.00*
Cut structurals, 3 ft. lengths	*50.00-51.00*
Cut structurals, 2 ft. and under	*52.00-53.00*
Heavy turnings	*39.00-40.00*
Punchings & plate scrap	*50.00-51.00*
Electric furnace bundles	*50.00-51.00*

Cast Iron Grades

No. 1 cupola	*44.00-45.00*
Heavy breakable cast	*42.00-43.00*
Unstripped motor blocks	*34.00-35.00*
No. 1 machinery cast	*51.00-52.00*

Railroad Scrap

No. 1 R.R. heavy melt	*48.00-49.00*
Rails, 2 ft and under	*67.00-68.00*
Rails, 18 in. and under	*68.00-69.00*
Rails, random lengths	*64.00-65.00*
Railroad specialties	*65.00-66.00*

Stainless Steel Scrap

18-8 bundles & solids	*380.00-400.00*
18-8 turnings	*280.00-300.00*
430 bundles & solids	90.00-100.00
430 turnings	65.00-70.00

CLEVELAND

No. 1 heavy melting	*36.50-37.50*
No. 1 factory bundles	*42.00-43.00*
No. 2 heavy melting	*33.00-34.00*
No. 1 bundles	*36.50-37.50*
No. 2 bundles	*30.00-31.00*
No. 1 busheling	*36.50-37.50*
Machine shop turnings	*22.00-23.00*
Mixed borings, turnings	*25.00-26.00*
Short shovel turnings	*25.00-26.00*
Cast iron borings	*25.00-26.00*
Cut foundry steel	*43.00-44.00*
Cut structurals, plates 2 ft and under	*49.00-50.00*
Low phos. punchings & plate	*37.50-38.50*
Alloy free, short shovel turnings	*29.00-30.00*
Electric furnace bundles	*37.50-38.50*

Cast Iron Grades

No. 1 cupola	*48.00-49.00*
Charging box cast	*37.00-38.00*
Heavy breakable cast	*37.00-38.00*
Stove plate	*44.00-45.00*
Unstripped motor blocks	*30.00-31.00*
Brake shoes	*37.00-38.00*
Clean auto cast	*47.00-48.00*
Burnt cast	*35.00-36.00*
Drop broken machinery	*50.00-51.00*

Railroad Scrap

No. 1 R.R. heavy melt	*45.00-46.00*
R.R. malleable	*53.00-54.00*
Rails, 2 ft and under	*66.00-67.00*
Rails, 18 in. and under	*67.00-68.00*
Rails, random lengths	*61.00-62.00*
Cast steel	*55.00-56.00*
Railroad specialties	*59.00-60.00*
Uncut tires	*58.00-59.00*
Angles, splice bars	*59.00-60.00*
Rails, rerolling	*67.00-68.00*

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	*320.00-330.00*
18-8 turnings	*220.00-230.00*
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

No. 1 heavy melting	*39.00-40.00*
No. 2 heavy melting	*35.50-36.50*
No. 1 bundles	*39.00-40.00*
No. 2 bundles	*33.00-34.00*
No. 1 busheling	*39.00-40.00*
Machine shop turnings	*22.00-23.00*
Short shovel turnings	*22.00-23.00*
Cast iron borings	*22.00-23.00*
Low phos.	*40.00-41.00*
Electric furnace bundles	*40.00-41.00*

Railroad Scrap

No. 1 R.R. heavy melt	*46.00-47.00*

CHICAGO

No. 1 hvy melt, indus.	*42.00-43.00*
No. 1 hvy melt, dealer	*40.00-41.00*
No. 2 heavy melting	*37.00-38.00*
No. 1 factory bundles	*46.00-47.00*
No. 1 dealer bundles	*42.00-43.00*
No. 2 bundles	*35.00-36.00*
No. 1 busheling, indus.	*42.00-43.00*
No. 1 busheling, dealer	*40.00-41.00*
Machine shop turnings	*26.00-27.00*
Mixed borings, turnings	*28.00-29.00*
Short shovel turnings	*28.00-29.00*
Cast iron borings	*28.00-29.00*
Cut structurals, 3 ft	*47.00-48.00*
Punchings & plate scrap	*48.00-49.00*

Cast Iron Grades

No. 1 cupola	*39.00-40.00*
Stove plate	*34.00-35.00*
Unstripped motor blocks	*29.00-30.00*
Clean auto cast	*44.00-45.00*
Drop broken machinery	*44.00-45.00*

Railroad Scrap

No. 1 R.R. heavy melt	*46.00-47.00*
R.R. malleable	*53.00-54.00*
Rails, 2 ft and under	*56.00-57.00*
Rails, 18 in. and under	*57.00-58.00*
Angles, splice bars	*54.00-55.00*
Rails, rerolling	*55.00-56.00*

Stainless Steel Scrap

18-8 bundles & solids	*330.00-340.00*
18-8 turnings	*230.00-240.00*
430 bundles & solids	*85.00-90.00*
430 turnings	*50.00-55.00*

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*37.00-38.00*
No. 2 heavy melting	*27.00-28.00*
No. 1 bundles	*36.00-37.00*
No. 2 bundles	*27.00-28.00*
No. 1 busheling	*37.00-38.00*
Machine shop turnings	*24.00-25.00*
Mixed borings, turnings	*25.00-26.00*
Short shovel turnings	*25.00-26.00*
Punchings & plate scrap	*48.00-49.00*

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	43.00
Stove plate	45.00
Heavy breakable	41.00
Unstripped motor blocks	29.00
Clean auto cast	52.00
Malleable	53.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*43.00*
No. 2 heavy melting	*39.00*
No. 1 bundles	*43.00*
No. 2 bundles	*34.00*
No. 1 busheling	*43.00*
Machine shop turnings	28.00
Short shovel turnings	30.00

Cast Iron Grades

No. 1 cupola	*43.00*
Charging box cast	*36.00*
Heavy breakable cast	*36.00*
Unstripped motor blocks	*36.00*
Brake shoes	*40.00*
Clean auto cast	48.50
Stove plate	40.00

Railroad Scrap

No. 1 R.R. heavy melt	*46.50*
Rails, 18 in. and under	*60.00*
Rails, rerolling	60.00
Rails, random lengths	*55.00*
Angles, splice bars	*57.00*

PHILADELPHIA

No. 1 heavy melting	*50.00*
No. 2 heavy melting	*40.00*
No. 1 bundles	*50.00*
No. 2 bundles	*39.00*
No. 1 busheling	*50.00*
Electric furnace bundles	*52.00*
Mixed borings, turnings	*38.00*
Short shovel turnings	*41.00*
Machine shop turnings	*35.00*
Heavy turnings	*46.00*
Structurals & plate	*55.00*
Couplers, springs, wheels	*60.00*
Rail crops, 2 ft & under	*67.00-69.00*

Caste Iron Grades

No. 1 cupola	*46.00*
Heavy breakable cast	56.00
Malleable	*62.00*
Drop broken machinery	55.00-56.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*43.00-44.00*
No. 2 heavy melting	*33.00-34.00*
No. 1 bundles	*43.00-44.00*
No. 2 bundles	*31.00-32.00*
Machine shop turnings	*23.00-24.00*
Mixed borings, turnings	*27.00-28.00*
Short shovel turnings	*28.00-29.00*
Low phos. (structurals & plate)	*46.00-47.00*

Cast Iron Grades

No. 1 cupola	41.00-42.00
Unstripped motor blocks	*32.00-33.00*
Heavy breakable	46.00-47.00

Stainless Steel

18-8 sheets, clips solids	360.00-370.00
18-8 borings, turnings	260.00
430 sheets, clips, solids	80.00-90.00
410 sheets, clips, solids	70.00-80.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*38.00-38.50*
No. 2 heavy melting	*31.00-31.50*
No. 1 bundles	*38.00-38.50*
No. 2 bundles	*29.00-29.50*
No. 1 busheling	*38.00-38.50*
Machine shop turnings	*22.00-23.00*
Mixed borings, turnings	*25.00-25.50*
Short shovel turnings	*27.00-28.00*
No. 1 cast	38.00-39.00
Mixed cupola cast	36.00-37.00
No. 1 machinery cast	44.00-45.00

BUFFALO

No. 1 heavy melting	*43.00-44.00*
No. 2 heavy melting	*37.00-38.00*
No. 1 bundles	*43.00-44.00*
No. 2 bundles	*37.00-38.00*
No. 1 busheling	*43.00-44.00*
Mixed borings, turnings	34.00-35.00
Machine shop turnings	31.00-32.00
Short shovel turnings	35.00-36.00
Cast iron borings	34.00-35.00
Low phos.	*48.00-49.00*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	43.00-44.00
No. 1 machinery	47.00-48.00

Railroad Scrap

Rails, random length	*53.00-54.00*
Rails, 3 ft and under	*58.00-59.00*
Railroad specialties	*48.00-49.00*

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*37.00-38.00*
No. 2 heavy melting	*33.00-34.00*
No. 1 bundles	*37.00-38.00*
No. 2 bundles	*27.00-28.00*
No. 1 busheling	*37.00-38.00*
Machine shop turning	*25.00-26.00*
Mixed borings, turnings	*25.00-26.00*
Short shovel turnings	*27.00-28.00*
Cast iron borings	*23.00-24.00*
Low phos. 18 in.	*48.00-49.00*

Cast Iron Grades

No. 1 cupola	*42.00-44.00*
Heavy breakable cast	*43.00-44.00*
Charging box cast	*43.00-44.00*
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt	*43.00-44.00*
Rails, 18 in. and under	*64.00-65.00*
Rails, random lengths	*54.00-55.00*

BIRMINGHAM

No. 1 heavy melting	*40.00-41.00*
No. 2 heavy melting	*35.00-36.00*
No. 1 bundles	*40.00-41.00*
No. 2 bundles	*24.00-25.00*
No. 1 busheling	*40.00-41.00*
Cast iron borings	26.00-27.00
Short shovel turnings	*33.00-34.00*
Machine shop turnings	*31.00-32.00*
Bar crops and plate	*49.00-50.00*
Structurals & plate	*48.00-49.00*
Electric furnace bundles	*46.00-47.00*
Electric furnace, 2 ft & under	*44.00-45.00*

(F.o.b. shipping point)
Cast Iron Grades

No. 1 cupola	48.00-49.00
Stove plate	47.00-48.00
Unstripped motor blocks	38.00-39.00
Charging box cast	37.00-38.00
No. 1 wheels	37.00-38.00

Railroad Scrap

No. 1 R.R. heavy melt	*45.00-46.00*
Rails, 18 in. and under	*53.00-54.00*
Rails, rerolling	*59.00-60.00*
Rails, random lengths	*49.00-50.00*
Angles, splice bars	*52.00-53.00*

SEATTLE

No. 1 heavy melting	**53.00**
No. 2 heavy melting	**48.00**
No. 1 bundles	**48.00**
No. 2 bundles	**30.00-32.00**
Machine shop turnings	**33.00-35.00**
Mixed borings, turnings	**33.00-35.00**
Electric furnace No. 1	**62.00-65.00**

Cast Iron Grades

No. 1 cupola	50.00-52.00
Heavy breakable cast	48.00-50.00
Unstripped motor blocks	40.00-41.00
Stove plate (f.o.b. plant)	42.00

LOS ANGELES

No. 1 heavy melting	55.00
No. 2 heavy melting	51.00
No. 1 bundles	54.00
No. 2 bundles	36.00
Machine shop turnings	36.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	60.00

SAN FRANCISCO

No. 1 heavy melting	*51.00*
No. 2 heavy melting	*46.00*
No. 1 bundles	*50.00*
No. 2 bundles	38.00
Machine shop turnings	35.00
Mixed borings, turnings	35.00
Cast iron borings	35.00
Heavy turnings	35.00
Short shovel turnings	37.00
Cut structurals, 3 ft	63.00

Cast Iron Grades

No. 1 cupola	57.00
Charging box cast	47.00-49.00
Stove plate	48.00
Heavy breakable cast	42.00
Unstripped motor blocks	50.00
Clean auto cast	57.00
No. 1 wheels	50.00
Drop broken machinery	57.00

HAMILTON, ONT.

No. 1 heavy melting	48.00
No. 2 heavy melting	43.00
No. 1 bundles	48.00
No. 2 bundles	37.00
Mixed steel scrap	40.00
Mixed borings, turnings	24.00
Busheling, new factory: Prepared	46.00
Unprepared	42.00
Short steel turnings	33.00
Rails, rerolling	54.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b., Hamilton, Ont.

A SYMBOL OF LEADERSHIP IN IRON & STEEL SCRAP SINCE 1889

Luria Brothers and Company, Inc.

MAIN OFFICE
PHILADELPHIA NATIONAL BANK BLDG.
Philadelphia 7, Penna.

PLANTS
LEBANON, PENNA. DETROIT (ECORSE), MICHIGAN
READING, PENNA. PITTSBURGH, PENNA.
MODENA, PENNA. ERIE, PENNA.

OFFICES
BIRMINGHAM, ALA. HOUSTON, TEXAS PUEBLO, COLORADO
BOSTON, MASS. LEBANON, PENNA. READING, PENNA.
BUFFALO, N. Y. LOS ANGELES, CAL. ST. LOUIS, MO.
CHICAGO, ILLINOIS NEW YORK, N. Y. SAN FRANCISCO, CAL.
CLEVELAND, OHIO PITTSBURGH, PA. SEATTLE, WASH.
DETROIT, MICH. MONTREAL, CANADA

EXPORTS-IMPORTS LIVINGSTON & SOUTHARD, INC. 99 Park Ave., New York, N. Y. *Cable Address:* **FORENTRACO**

Strikes Hit Copper Mines

The Braden mine strike in Chile could be drawn out because it is renegotiation time. Workers' contract expired on Mar. 31. Northern Rhodesian mine strike not considered serious yet

Nonferrous Metal Prices, Pages 166 & 167

STRIKES at the Braden (Chile) and Mufulira (Northern Rhodesia) mines have helped firm the world copper market.

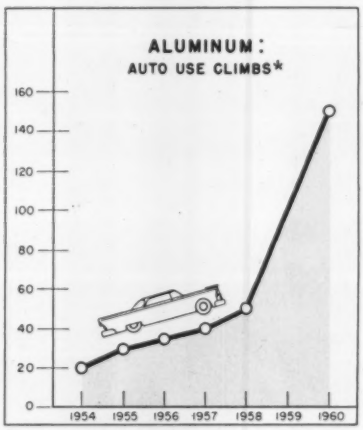
What It Means—Braden produces 15,000 tons a month. Mufulira has a monthly rated capacity of about 9000 tons. With copper inventories at relatively high levels (world refined stocks were 369,956 tons at the beginning of March), there should be no great concern about the possible loss of 24,000 tons during the next month. But consumers, who have worked inventories to the floor, are jittery and are showing signs of being ready to rush into the market. Another stimulant: Users are sure the price will not fall any more as long as there is a copper mine strike anywhere in the world.

Outlook: 1. The strikes are not serious. They could take on darker overtones if the Mufulira mine strike stimulates a general walkout in Northern Rhodesia. 2. Primary producers report that mill product sales are on the upturn and showed signs of strengthening prior to strike reports.

BDSA Report — The Copper Division, Business & Defense Services Administration, explains that under contracts issued for copper purchases, the government will buy about 4000 tons a month if the U.S. market price drops below 29 cents a pound. If the price should plummet below 27 cents, the U.S. will buy an additional 6000 tons.

Inco Strike Ends

International Nickel Co.'s Huntington, W. Va., rolling mill is returning to full production. Striking United Steelworkers went back to work on Apr 4. The strike call went out Jan. 13. Results: 1. Average hourly pay increases granted amount to about 15 cents an hour, 2 cents more than was originally offered by the company. 2. Union demand for a closed shop was defeated. 3. Inco will be allowed to introduce a voluntary vested plan for workers. 4. The union dropped its demands for the arbitration of standards and for a Supplementary Unemployment Benefit plan.



*Pounds per average automobile.
Source: STEEL estimates.

Aluminum Impacts Soar

Aluminum impact extrusion production has tripled in the last decade, says Norman Olsen, product manager-impacts, Aluminum Co. of America. More than 300 million aluminum impact extrusions are being produced annually. Some automotive applications: Oil filter cases, spark plug shields, brake pistons, power brake reservoirs.

Aluminum trends: 1. James M. Kennedy, chairman, Revere Copper & Brass Inc., explained to stockholders recently: "The over-all picture appears to indicate a somewhat lower poundage output for copper and brass this year than in 1956, a higher output for aluminum . . . " 2. General Motors Corp. has received a patent for a V-8 engine to be made of aluminum and magnesium alloy castings and stampings.

Moly's Use Grows

Free World molybdenum consumption climbed from 56 million lb in 1955 to 62 million lb last year, estimates Climax Molybdenum Co. U.S. consumption: 39 million lb in 1956, versus 37 million lb in 1955.

Climax estimates: In the U.S. market, 49 per cent of the molybdenum used goes into the production of constructional low alloy steel; 11 per cent, cast iron; 11 per cent, tool steels; 8 per cent, steel castings; 6 per cent, stainless steels; 15 per cent, other uses.

Lead, Zinc: Barely Average

Lead and zinc sales are barely average. Zinc diecasters are purchasing only limited amounts. Galvanizers are cutting back orders as inventories of galvanized sheets stack up.

NONFERROUS PRICE RECORD

	Price Apr. 4	Last Change	Previous Price	Mar. Avg.	Feb. Avg.	Apr., 1956 Avg.
Aluminum ..	27.10	Aug. 10, 1956	25.90	27.100	27.100	24.650
Copper	32.00	Apr. 2, 1957	31.75–32.00	31.462	32.863	47.500
Lead	15.80	Jan. 13, 1956	16.30	15.800	15.800	15.800
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	33.150
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	64.500
Tin	99.00	Mar. 28, 1957	99.75	99.683	101.159	99.270
Zinc	13.50	Jan. 6, 1956	13.50	13.500	13.500	13.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.

BRIDGEPORT BRASS

COPPER ALLOY BULLETIN

Reporting New Developments in Copper-Brass Alloys and Metalworking Methods

TIPS ON MACHINING DURONZE (ALUMINUM-SILICON BRONZE) ROD

by M. A. BUELL
Chief Staff Metallurgist

Our general designation for silicon bronze rod is Duronze. Duronze 707 is one of these alloys and contains 91.0% copper, 7.0% aluminum and 2.0% silicon. This composition makes Duronze a tough, strong and corrosion-resistant alloy suitable for a variety of applications, such as gears, pump parts, pinions, valve parts, etc.

It is this toughness which has to be considered when machining Duronze 707. Although the chip is brittle, its tensile strength is 50% greater than that of leaded brass. Consequently, extra machining power is required. Likewise, tools of a high degree of hardness, such as carbide-tipped tools, should be used. The tools should be set on center, or slightly below, to insure correct front clearance. Any rubbing will result in rapid wear to the tools. Above all, sharp tools are essential.

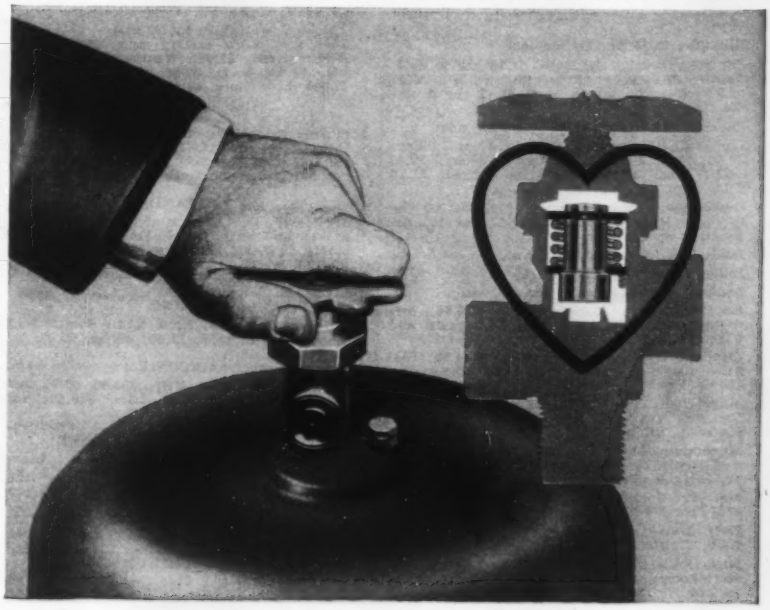
Cooling is most important when machining Duronze 707. The heat build-up, due to friction between the tool and the metal, is considerable. Consequently, the heat must be dissipated with a plentiful flow of coolant. A low-viscosity mineral oil of around 100 Saybold seconds is generally satisfactory. Sulphurized mineral oil can also be used but tends to stain.

Deep cuts should be avoided, but can be handled without trouble by splitting the operation into roughing cuts and finishing cuts. This procedure also helps increase accuracy and helps improve surface finishes since it tends to variations in dimensions and surfaces.

An article of this nature commonly high lights some of the topics involved. More complete information on specific problems—whether on Duronze or any other copper alloy—can be obtained by writing or phoning your nearest Bridgeport Sales Office. Our field men will be glad to serve you.

Propane Valve Uses Duronze* "Heart" For Extra Strength And Trouble-Free Service

*Aluminum-silicon bronze



The cylinder valves that regulate LP gas in home systems must have tough construction, be easy to operate and offer maximum safety. To fill these needs, the Aluminum and Brass Co., Inc. of Lockport, N. Y. makes high-quality propane valves that use Bridgeport's Duronze 707 Alloy for the lower stem assembly—the "heart" of the valve.

Duronze Requirements

These stems must really take it—stand up under severe service, be unaffected by sudden temperature changes and also resist corrosion to avoid freezing or sticking. To meet these tough material requirements, the manufacturer specified Duronze 707—a high-strength, aluminum-silicon bronze alloy that can also be machined to the close tolerances needed for the valve parts.

Solving the Problem

Before Duronze was used, the lower valve stem was made of brass. The constant shutoff action of the valve exerted a crushing pressure on the stem, which in turn developed a concave area in the brass seating member and prevented a gastight seal. Because Duronze is not affected by this shutoff action, this problem has been eliminated.

Matching Metal to Job

These propane valves are another example of how Bridgeport matches the metal to the job. By working closely with the manufacturer, the Bridgeport salesman was able to meet his specifications exactly and help contribute to the over-all superiority of the product. The Bridgeport salesman who calls on you, or our nearest sales office, is always ready to offer you the same service on your products. Call them to use this service to your advantage.

BRIDGEPORT BRASS

Bridgeport Brass Company, Bridgeport 2, Connecticut, Offices in Principal Cities
In Canada: Noranda Copper and Brass Limited, Montreal

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 27.10; pigs, 25.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.90; No. 43, 28.70; No. 195, 30.30; No. 241, 30.50; No. 356, 28.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.
Cobalt: 97-99%, $2.35 per lb for 550-lb keg; $2.37 per lb for 100-lb case; $2.42 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 32.00 deld. Conn. valley; 32.00 deld. Midwest; custom smelters, 32.00 deld.; lake, 32.00 deld.; fire refined, 31.75 deld.

Germanium: First reduction, $201.85-$220 per lb; intrinsic grade, $229-$242.67 per lb, depending on quantity.

Gold: U.S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $100-$110 nom. per troy oz.

Lead: Common, 15.80; chemical, 15.90; corroding, 15.90, St. Louis. New York basis, add 0.20.

Lithium: 98+%, cups or ingots, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 35.25; ingot, 36.00, f.o.b. Velasco, Tex. 13 in. sticks, 59.00, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91B (diecasting), 37.25 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $255-$257 per 76-lb flask.

Molybdenum: Extruded ingot, $9.60 per pound, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot or ingots for addition to cast iron, 74.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01.

Osmium: $80-$100 per troy oz, nom.

Palladium: $23-$24 per troy oz.

Platinum: $92-$95 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $12-$15 per lb.

Silver: Open market, 91.375 per troy oz.

Sodium: 16.50, c.l.; 17.00, l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.65 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 99.00.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.), $2.75; grade A-2 (0.5% Fe max.), $2.50 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $4.00 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $4.75.

Zinc: Prime Western, 13.50; brass special, 13.75; intermediate, 14.00, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 14.85; special high grade, 15.25 deld. Die casting alloy ingot No. 3, 17.50; No. 2, 18.50; No. 5, 18.00 deld.
Zirconium: Ingots, commerical grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, commerical grade, $10 per lb; reactor grade, $14-$22 per lb depending on quantity. Powder electronics grades, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.75-29.75; No. 12 foundry alloy (No. 2 grade), 22.00-23.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.50; 13 alloy, 0.60 Cu max., 24.75-25.50; 195 alloy, 24.50-26.25; 108 alloy, 22.50-23.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.75; grade 2, 22.00; grade 3, 21.00; grade 4, 20.25.
Brass Ingot: Red brass, No. 115, 31.50; tin bronze, No. 225, 40.50; No. 245, 35.50; high-leaded tin bronze, No. 305, 35.50; No. 1 yellow, No. 405, 25.25; manganese bronze, No. 421, 28.50.
Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 37.50; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.83-$1.86, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.80, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 37.355; l.c.l., 37.98. Weatherproof, 30,000-lb lots, 37.78; l.c.l., 38.53. Magnet wire deld., 15,000 lb or more, 44.68; l.c.l., 45.43.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $21.50 per cwt; pipe, full coils, $21.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $11.00-$14.75; sheared mill plate, $9.25-$11.25; wire, $8.50-$11.00; forging billets, $6.85-$7.10; hot-rolled and forged bars, $7.10-$7.35.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $20.35; H.R. strip, $23.95; C.R. strip, $32.00; forged or H.R. bars, $18.40; wire, 0.015 in., 8.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheet and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.249-0.138	40.90-45.40	....
0.135-0.096	41.40-46.50	37.70-39.60
0.095-0.077	42.10-48.30	37.80-39.80
0.076-0.061	42.70-50.60	38.20-40.50
0.060-0.048	43.40-52.90	38.80-41.50
0.047-0.038	43.90-55.60	38.80-42.90
0.037-0.030	44.30-50.00	40.40-44.70
0.029-0.024	44.90-52.40	41.00
0.023-0.019	45.80-52.20	42.00
0.018-0.017	46.60-53.30	42.60
0.016-0.015	47.50-53.90	43.40
0.014	48.50-50.90	44.40
0.013-0.012	49.70-52.10	45.10
0.011	50.70-53.70	46.30
0.010-0.0095	52.10-54.40	47.60
0.009-0.0085	53.40	49.10
0.008-0.0075	55.00	50.03
0.007	56.50	51.80
0.006	58.10	53.20

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	40.2	44.5
5050-F	41.3	45.6
3004-F	42.3	47.5
5052-F	42.9	48.2
6061-T6	44.4	50.0
2024-T4*	48.1	54.4
7075-T6*	55.4	62.5

*24-48 in. widths or diam., 72-180 lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	74.30	71.50	....	....
0.156-0.172	63.00	60.40	....	....
0.188	63.00	60.40	....	76.40
0.219-0.234	59.70	57.20	....	....
0.250-0.281	59.70	57.20	....	73.00
0.313	59.70	57.20	....	69.60
0.344	58.50	....	....	....
Cold-Finished				
0.375-0.547	58.80	57.50	70.10	65.50
0.563-0.688	58.80	57.50	66.70	61.60
0.750-1.000	57.40	56.00	61.00	58.10
1.063	57.40	56.00	....	56.10
1.125-1.500	55.20	53.90	59.00	56.10
Rolled				
1.563	53.70	52.40	....	....
1.625-2.000	53.10	51.60	....	....
2.125-2.500	51.70	50.30	....	....
2.563-3.375	50.20	48.70	....	....

Forging Stock: Round, Class 1, 43.30-55.90 in specific lengths 36-144 in., diam. 0.375-8 in. Rectangles and squares, Class 1, 48.10-63.20 in random lengths, 0.375-4 in. thick, width 0.0750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$18.45	2	$ 57.00
1	29.00	4	157.20
1¼	39.25	6	281.65
1½	46.95	8	423.80

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	43.10-44.60	57.80-61.80
12-14	43.40-44.80	58.40-62.70
15-17	43.60-45.40	59.60-64.30
18-20	44.10-45.80	61.50-66.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.0 in., 93.30. Thread plate, .188 in., 71.70; .250-2.0 in., 70.60. Tooling plate, .250-3.0 in., 73.0.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-28	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)
Aluminum: 1100 clippings, 13.00-13.50; old sheets, 8.00-8.50; borings and turnings, 6.00-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	54.13b	51.36c	....	54.32	28.000	28.000	27.250
Yellow Brass	47.52	37.69d	48.06	50.43	21.875	21.625	20.125
Low Brass, 80%	50.20	50.14	50.74	53.01	24.250	24.000	23.500
Red Brass, 85%	51.14	51.08	51.68	53.95	25.000	24.750	24.250
Com. Bronze, 90%	52.63	52.57	53.17	55.19	25.875	25.625	25.125
Manganese Bronze	55.43	49.33	59.77	....	20.500	20.250	19.750
Muntz Metal	49.79	45.60	....	....	20.750	20.500	20.000
Naval Brass	51.69	46.00	58.75	55.10	20.500	20.250	19.750
Silicon Bronze	58.60	57.79	58.64	60.68e	27.375	27.125	26.375
Nickel Silver, 10%	64.06	66.39g	66.39	....	28.250	28.000	14.125
Phos. Bronze, A-5%	73.17	72.67	73.67	74.85	28.875	28.625	27.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

6.50; crankcases, 8.00-8.50; industrial castings, 8.00-8.50.

Copper and Brass: No. 1 heavy copper and wire, 23.50-24.00; No. 2 heavy copper and wire, 22.00-22.50; light copper, 20.00-20.50; No. 1 composition red brass, 20.00-20.50; No. 1 composition turnings, 19.00-19.50; yellow brass turnings, 12.00-12.25; new brass clippings, 18.50-19.00; light brass, 12.00-12.50; heavy yellow brass, 14.00-14.50; new brass rod ends, 16.50-17.00; auto radiators, unsweated, 15.00-15.50; cocks and faucets, 16.00-16.50; brass pipe, 16.50-17.00.

Lead: Heavy, 12.00-12.50; battery plates, 6.25-6.75; linotype and stereotype, 13.00-14.00; electrotype, 12.50-13.00; mixed babbitt, 12.00-13.50.

Monel: Clippings, 65.00-75.00; old sheets, 60.00-70.00; turnings, 50.00-60.00; rods, 65.00-75.00.

Nickel: Sheets and clips, 115.00-165.00; rolled anodes, 115.00-165.00; turnings, 100.00-140.00; rod ends, 115.00-165.00.

Zinc: Old zinc, 4.50-5.00; new die-cast scrap, 3.75-4.00; old die-cast scrap, 2.25-2.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 17.50; 3003 clippings, 17.50; 6151 clippings, 17.50; 5052 clippings, 17.00-17.50; 2014 clippings, 16.50-17.00; 2017 clippings, 16.50-17.00; 2024 clippings, 16.50-17.00; mixed clippings, 16.50; old sheets, 14.50; old cast, 14.50; clean old cable (free of steel), 16.50-17.50; borings and turnings, 14.50-15.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 54.00; light scrap, 49.00; turnings and borings, 34.00.

Copper and Brass: No. 1 heavy copper and wire, 27.00; No. 2 heavy copper and wire, 26.00; light copper, 23.75; refinery brass (60% copper) per dry copper content, 25.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 27.00; No. 2 heavy copper and wire, 26.00; light copper, 23.75; No. 1 composition borings, 23.00; No. 1 composition solids, 23.50; heavy yellow brass solids, 17.50; yellow brass turnings, 16.50; radiators, 18.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 50.29; oval, 49.42, 5000-10,000 lb; electrodeposited, 39.25, 2000-5000 lb lots; cast, 44.00. 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab; less than 200 lb, 117.50; 200-499 lb, 116.00; 500-999 lb, 115.50; 1000 lb or more, 115.00.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb, in 100-lb drums.

Chromic Acid: 100 lb, 33.20; 500 lb, 32.70; 2000 lb, 32.05; 5000 lb, 31.75; 10,000 lb, 31.25, f.o.b. Detroit.

Copper Cyanide: 100-1000 lb, 77.50.

Copper Sulphate: 100 lb, 26.65; 200 lb, 23.65; 300 lb, 22.65; 400 lb, 22.15; 500 lb, 20.65; 2000 lb, 18.40; 6000 lb, 18.15; 12,000 lb, 17.90, f.o.b. shipping point.

Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400 lb, 43.50; 5000 lb, 41.50; 10,000 lb, 40.50.

Nickel Sulphate: 100 lb, 40.50; 200 lb, 38.50; 300 lb, 37.50; 400 lb, 35.50; 5000 lb, 33.50; 20,000 lb, 33.00; 36,000 lb, 32.50.

Sodium Cyanide: 100 lb, 27.50; 200 lb, 25.80; 400 lb, 22.80; 1000 lb, 21.80, f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 78.00; 100-600 lb, 68.80; 700-1900 lb, 66.00; 2000-9900 lb, 64.10; 10,000 lb or more, 62.80.

Stannous Chloride (anhydrous): Less than 25 lb, 167.70; 25 lb, 132.70; 100 lb, 117.70; 400 lb, 115.30; 5200-19,600 lb, 103.10; 20,000 lb or more, 90.90.

Stannous Sulphate: Less than 50 lb, 130.40; 50 lb, 100.40; 100-1900 lb, 98.40; 2000 lb or more, 96.40.

Zinc Cyanide: Under 1000 lb, 55.55; 1000 lb and over, 53.55.

STEEL
IMMEDIATE DELIVERY
PRIME NEW

Angles	¾" x ¾" x ⅛" to 8" x 8" x 1⅛"
I-Beams	3" to 24"
W.F. Beams	4" to 36"
Channels	3" to 18"
Reinforcing Rods	⅜" to 1¼"
Reinforcing Wire Mesh	10 Gauge to 5 Gauge
Plates	3/16" to 3"
H.R. Sheets	16 Gauge to 7 Gauge
Galvanized Sheets	30 Gauge to 16 Gauge
Corrugated Galvanized Sheets	28 Gauge & 24 Gauge

Bars—Flats—Rounds—Squares

WE INVITE YOUR STEEL INQUIRIES

CALUMET IRON & SUPPLY CO.

175 West Chicago Ave. **East Chicago, Ind.**

PHONES: Chicago, Ill.—REgent 4-6020—East Chicago, Indiana 1868

WANTED

GENERAL MANAGER

Large, multi plant, metal working company wants a general manager for one of its plants. Experience in metal fabricating techniques and machine shop operations is essential. A degree is required, preferably in engineering. The general manager will be responsible for manufacturing, engineering, purchasing and other allied functions.

Excellent opportunity for advancement to the position of V. P. for manufacturing. Send resume of educational and experience background to **Box 540, STEEL, Penton Bldg., Cleveland 13, Ohio.**

FOR SALE

50% of

18 to 20 man Tool Shop, well equipped. Ill health and other interest reason for selling. Party should be able to estimate and handle business contacts.

Write Box 539, STEEL
Penton Bldg. Cleveland 13, Ohio

INDUSTRIAL ENGINEER

Progressive Company engaged in basic process and pyrometallurgy offers unusual opportunity for industrial engineer, preferably having experience in steel or other heavy industry. Must be capable of establishing and administering job evaluation program. Experience in time and motion study as well as material handling desirable. Location northeast section of United States. Position will require some travel to midwest and southern plants. All replies held strictly confidential. Submit detailed resume covering educational background, experience and salary requirements to Box 534, STEEL, Penton Bldg., Cleveland 13, Ohio.

CLASSIFIED

Help Wanted

WANTED: METALLURGIST FOR NEW ENGLAND foundry producing carbon low alloy and stainless steel castings. Should be metallurgical graduate with technical ability direct laboratory and melting furnaces. Submit resume giving experience, education, age, and salary expected. Reply Box 528, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

ENGINEER: SEASONED, CREATIVE, SINCERE, desires new connection with progressive organization in field of metal fabricating, machinery or allied products. Experience covers construction, development, design, standardization, specifications, material handling, inventory control. Education, experiences and interests lie in producing and procuring at lowest costs. For resume write Box 537, STEEL, Penton Bldg., Cleveland 13, Ohio.

MASTER MECHANIC—M.E. GOOD ORGANizer capable working on ideas covering tools, dies, jigs, metnods, improvements. Age 46. Consider small salary plus bonus. Box 536, STEEL, Penton Bldg., Cleveland 13, Ohio.

FACTORY MGR. (MFG. ENG.)—STAMPINGS. Related operations, machining, excelling in scheduling, tooling, tool design, product design and composite experience, progressive, deep draws, welding. Prefer medium size firm with good potential. Interested in five figure salary. Age 46, sober, highest integrity. Write Box 542, STEEL, Penton Bldg., Cleveland 13, Ohio.

WANTED IMMEDIATELY

First class Structural Engineer wanted for large fabricating plant in the Southwest, fabricating steel for mill and tier buildings and all types of highway, turnpike and expressway projects.

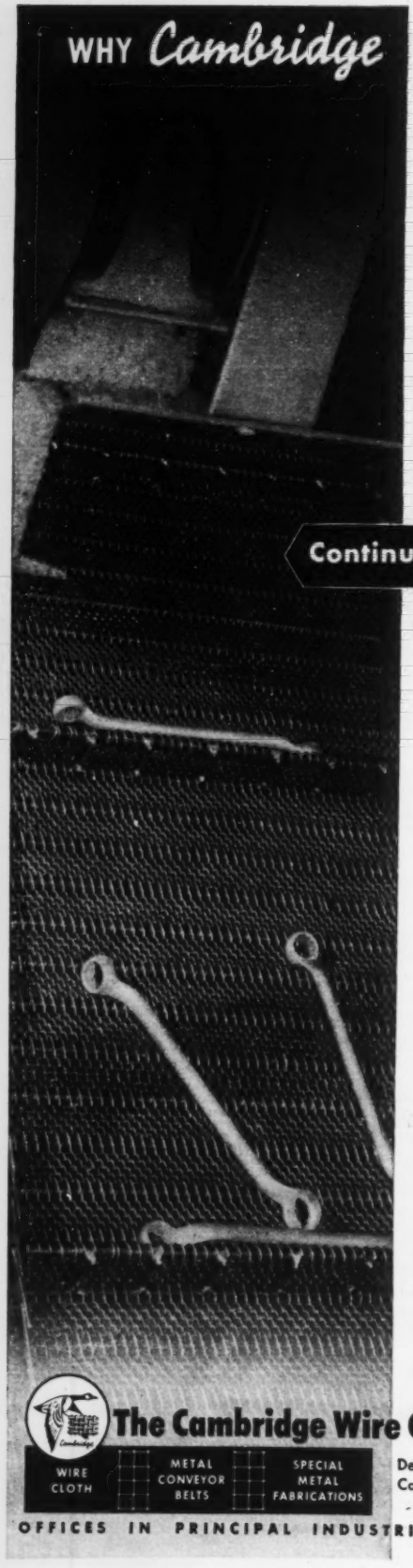
Applicant should be about 35-40 years old with about 15 years experience in detail drafting office. Requirements of college graduate or registered engineer are not essential provided applicant has sufficient education and experience to qualify as a registered engineer.

Excellent opportunity for advancement—Ideal working conditions in air-conditioned office—Company benefits—Insurance—Hospitalization — Vacation — Retirement — Paid Holidays and Sick Leave.

Enclose complete resume of personal history, education and experience.

Box 535, STEEL

Penton Bldg. Cleveland 13, Ohio



WHY *Cambridge* **Woven Wire Belts**

mean low cost, continuous heat treating

Baskets and manual handling become things of the past, treatment is more uniform, capacity increases . . . *if* you eliminate batch operation and combine movement on woven wire conveyor belts with annealing, brazing, quenching, oiling, tempering, sintering. Your products move continuously in a belt-to-belt flow all through the heat treat cycle, process costs drop in all departments. FOR EXAMPLE:

Continuous Quenching

ALL-METAL BELT moves wrenches out of quench tank continuously, dumps and returns for more. Woven wire construction from corrosion-resistant alloy provides lasting strength . . . has no seams, lacers or fasteners to break or wear.

SPECIAL CROSS FLIGHTS pick up parts from tank, hold them on the belt during inclined travel.

OPEN MESH permits rapid drainage of quench solution, quick drying of parts—also provides free circulation of atmosphere in furnace cycles for more uniform annealing and brazing.

OPTIONAL CHAIN DRIVE provides positive motion for heavy loads or inclined movement. Friction drive easily handles most loads.

Cambridge Woven Wire Conveyor Belts are made in any size, mesh or weave, from any metal or alloy, and can be used under a wide range of conditions . . . hot or cold, wet or dry. Call your Cambridge Field Engineer to discuss how you can cut costs with continuous processing on woven wire conveyor belts. Look for his 'phone number under "Belting, Mechanical" in the Yellow Pages or write for FREE 130-PAGE REFERENCE MANUAL.

The Cambridge Wire Cloth Co.

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

Department J, Cambridge 4, Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

(*Concluded from page* 161)

scrap prices have declined $13.50 since January. No. 1 heavy melting at $38, shipping point, compares with $51.50 paid by brokers for district shipment in the first month of 1957. The latest decline is $2 a ton in heavy melting, with machine shop turnings off $3.

St. Louis — Prices continue to sag. Most melters are lowering their buying prices and ordering only what can be shipped within a time limit. Scrapyards have reduced their stocks to a minimum.

Cincinnati—Scrap prices slipped $2 to $6 a ton on the major steelmaking grades last week. This resulted from a drastically reduced buying program by an area mill. No. 1 heavy melting dropped $6 to a range of $37-$38, brokers' buying price. Brokers said the mill is adjusting its inventory position. Another area mill has not entered the market. No. 2 heavy melting at $33-$34 is off $3.50 a ton.

Birmingham—Scrap prices continue downward. Brokers predict further cuts over coming weeks. Mills hold sizable inventories and are buying sparingly. A Georgia mill that bought No. 2 heavy melting early in March has canceled all its contracts that are not completed. When it returns to the market shortly, it is expected to offer prices below its last purchase.

Los Angeles—Scrap prices are holding. Dealers say the listings will hold through April. Mills continue to press for lower quotations.

Seattle — Dealers report weakness. Larger consumers are expected to lower their offering prices this week. They are in good inventory position and apparently feel current prices are out of line with the market situation. A drop of at least $2 a ton is expected.

Receipts continue in good volume. Exporters are busy executing old commitments.

General Metals of the Aleutians, Tacoma, Wash., which barged 5000 tons of scrap from remote Alaskan points last year, will resume salvaging operations in that area in May, and plans to bring out 7500 tons during the season. The scrap, resulting from military operations, will come from Adak, Amchitka, Shemya and Attu islands.

Advertising Index

Aetna-Standard Engineering Co., The ..... Inside Back Cover
Ajax Electric Co. 142
Alco Products, Inc. 27
Alemite, Division of Stewart-Warner Corporation 43
Allen Manufacturing Co. 11
Allis-Chalmers ..... Inside Front Cover
Alloy Metal Products, Inc. 140
American Air Filter Co., Inc. 90
American Machine & Foundry Co., Cleveland Welding Division 107
American Metal Market 12
American MonoRail Co. 170
American Optical Co., Safety Products Division 58
American Smelting & Refining Co., Continuous-Cast Products Department 83
American Smelting & Refining Co., Federated Metals Division 108, 109
American Steel & Wire Division, United States Steel Corporation 32
American Welding & Manufacturing Co., The. 52
Atlas Car & Mfg. Co., The 10

Baker-Raulang Co., The 3
Baldwin-Lima-Hamilton Corporation, Hamilton Division 49
Baldwin-Lima-Hamilton Corporation, Loewy-Hydropress Division 51
Bearings, Inc. 119
Behr-Manning Co., A Division of Norton Co.. 21
Bethlehem Steel Co. 1
Bliss & Laughlin, Inc. 22
Bliss, E. W., Co. 18, 19
Bridgeport Brass Co. 165
Buschman, E. W., Co., The 130

Cadman, A. W., Mfg. Co. 159
Calumet Iron & Supply Co. 167
Cambridge Wire Cloth Co., The 168
Cannon-Muskegon Corporation 112
Carborundum Co., The, Coated Abrasives Division 39
Chambersburg Engineering Co. 160
Chandler Products Corporation 146
Cincinnati Grinders, Inc. 67
Cincinnati Shaper Co., The 13
Cities Service Oil Co. 68
Cleveland Tramrail Division, The Cleveland Crane & Engineering Co. 127
Cleveland Welding Division, American Machine & Foundry Co. 107
Coes Knife Co. 160
Cold Metal Products Co., The 138
Coles Cranes, Inc. 134
Colorado Fuel & Iron Corporation, The 105
Columbia-Geneva Steel Division, United States Steel Corporation 32
Columbia-Southern Chemical Corporation ... 131
Continuous-Cast Products Department, American Smelting & Refining Co. 83
Crucible Steel Company of America 102

Detroit Steel Corporation 56
DoAll Co., The 113
Dresser Industries, Inc., Dresser Manufacturing Division 159
Dresser Industries, Inc., Roots-Connersville Blower Division 126
Drop Forging Association 133

Federated Metals Division of American Smelting & Refining Co. 108, 109
Femco, Inc. 23
Fischer Special Mfg. Co. 145
Frasse, Peter A., & Co., Inc. 17

Gardner-Denver Co. 26
General Ultrasonics Co., The 123
Great Lakes Steel Corporation 72

Hamilton Division, Baldwin-Lima-Hamilton Corporation 49
Harco Corporation, The 124
Harnischfeger Corporation, Industrial Division. 120
Haynes Stellite Co., A Division of Union Carbide & Carbon Corporation 24
Heppenstall Co. 80
Herr Equipment Corporation, The 129
Hill Acme Co., The 42
Holcroft & Co. 128
Horsburgh & Scott Co., The 122
Houghton, E. F., & Co. 46, 47

Illinois Gear & Machine Co. 44
Industrial Brownhoist Corporation 125

Johnson Bronze Co. 48
Jones & Lamson Machine Co. 86

Landis Machine Co. 30, 31
Link-Belt Co. 7
Loewy-Hydropress Division, Baldwin-Lima-Hamilton Corporation 51
Luria Brothers & Co., Inc. 163

Michigan Chrome & Chemical Co. 159
Micro Switch, A Division of Minneapolis-Honeywell Regulator Co. 50
Minneapolis-Honeywell Regulator Co., Micro Switch Division 50
Monarch Aluminum Mfg. Co. 20

National Automatic Tool Co., Inc. 34, 35
National Steel Corporation 72
Norgren, C. A., Co. 117
Norton Co., Behr-Manning Co. Division 21

Oakite Products, Inc. 132
Ohio Crankshaft Co., The 2
Ohio Ferro-Alloy Corporation 101

Pennsylvania Salt Manufacturing Co. ... 136, 137
Pittsburgh Steel Products, A Division of Pittsburgh Steel Co. 40, 41
Pivot Punch & Die Corporation 160

Reading Crane & Hoist Corporation 79
Republic Steel Corporation 28, 29
Research-Cottrell, Inc. 110, 111
Rollway Bearing Co., Inc. 37
Roots-Connersville Blower, A Division of Dresser Industries, Inc. 126
Ross Operating Valve Co. 76
Ryerson, Joseph T., & Son, Inc. 55

Salem-Brosius, Inc. 38
Scott Paper Co. 8
Selas Corporation of America 45
Service Steel 160
Silent Hoist & Crane Co. 161
Simonds Saw & Steel Co. 36
Socony Mobil Oil Co., Inc. 14, 15
Square D Co. 148
Stalwart Rubber Co. 143
Standard Pressed Steel Co., Flexloc Locknut Division 135
Stewart-Warner Corporation, Alemite Division. 43
Sun Oil Co., Industrial Products Department .. 9

Tennessee Coal & Iron Division, United States Steel Corporation 32
Thomas Truck & Caster Co. 87
Timken Roller Bearing Co., The ..... Back Cover
Towmotor Corporation 33

Union Carbide & Carbon Corporation, Haynes Stellite Co. 24
United Engineering & Foundry Co. 25
United States Rubber Co., Mechanical Goods Division 99
United States Steel Corporation, Subsidiaries.. 32
United States Steel Export Co. 32

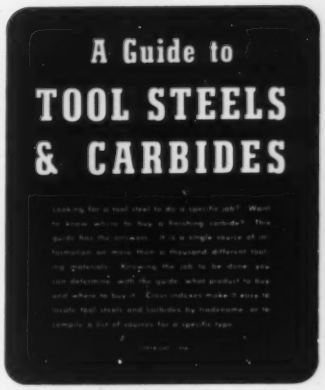
Veeder-Root, Inc. 4
Verson Allsteel Press Co. 75

Ward Steel Co. 79
Wheelabrator Corporation 89
Wickwire-Spencer Steel Division of The Colorado Fuel & Iron Corporation 105

Yoder Co., The 16
Youngstown Foundry & Machine Co., The 85

Table of Contents, Page 5

Classified Advertising, Page 167



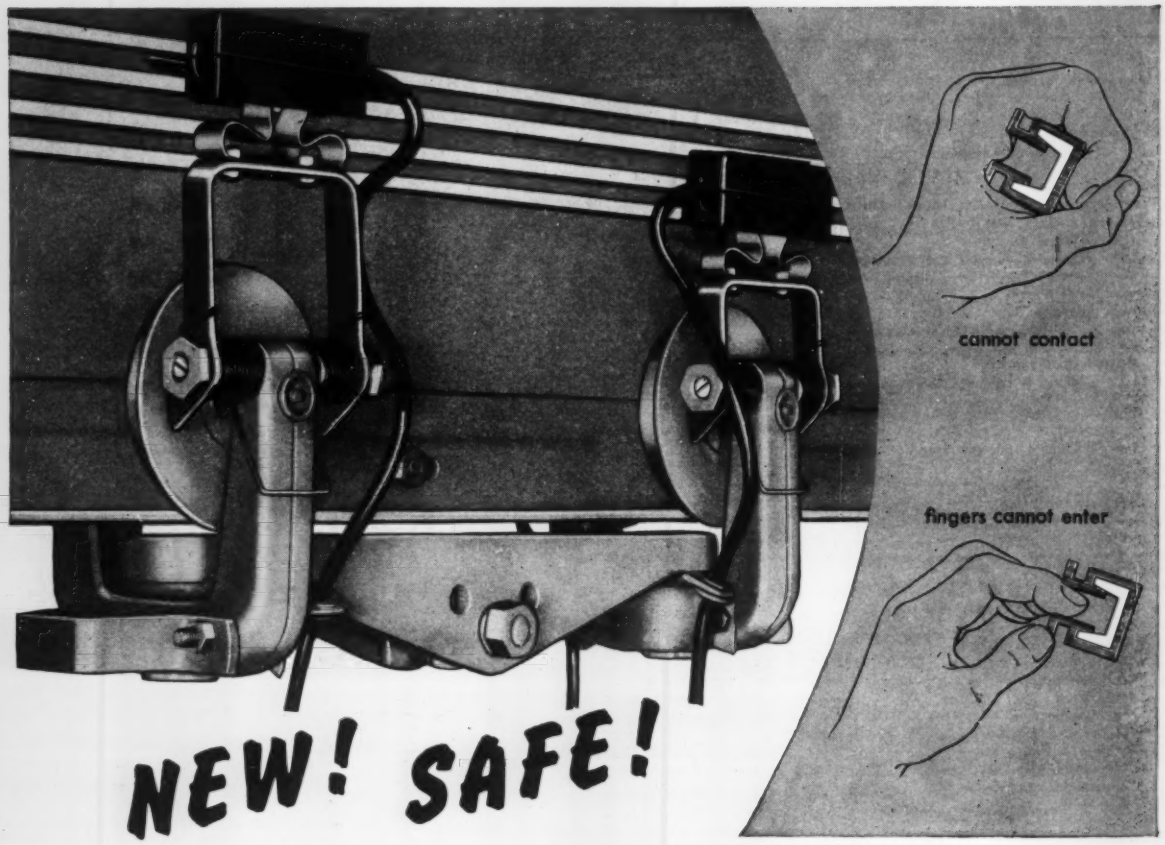
HERE'S HELP for your tooling problems

Looking for a tool steel to do a specific job? Want to know where to buy a finishing carbide? This guide has the answers. It is a single source of information on more than a thousand different tooling materials. Knowing the job to be done, you can determine, with the guide, what product to buy and where to buy it. Cross indexes make it easy to locate tool steels and carbides by tradename, or to compile a list of sources for a single type.

40 PAGES

Copies of the Guide to Tool Steels & Carbides are available from Editorial Service, STEEL, Penton Bldg., Cleveland 13, O., at the following prices:

1 to 10	$2.00 ea.
11 to 50	1.90 ea.
51 to 100	1.80 ea.
101 to 200	1.70 ea.
over 200	1.60 ea.



NEW! SAFE!

AMERICAN MONORAIL

KANT SHOCK

SHIELDED ELECTRIFICATION

For Monorail Track and Crane Systems

By covering its standard bus bar electrification with a specially designed polyvinyl chloride extrusion, American MonoRail now furnishes completely safe electrified systems.

This KANT-SHOCK shielding absolutely prevents accidental contact with live bus bars. It is impossible for an adult's finger to enter the shield.

A new type sliding shoe collector provides a floating contact throughout a monorail system regardless of any misalignment due to bent bars or at switch and inter-lock connections.

KANT-SHOCK Electrification positively eliminates all the hazards of open bar conductors—prevents costly accidents—protects employees—reduces insurance rates.

Write for KANT-SHOCK Bulletin KS-1

Member of Materials Handling Institute and Monorail Manufacturers Association

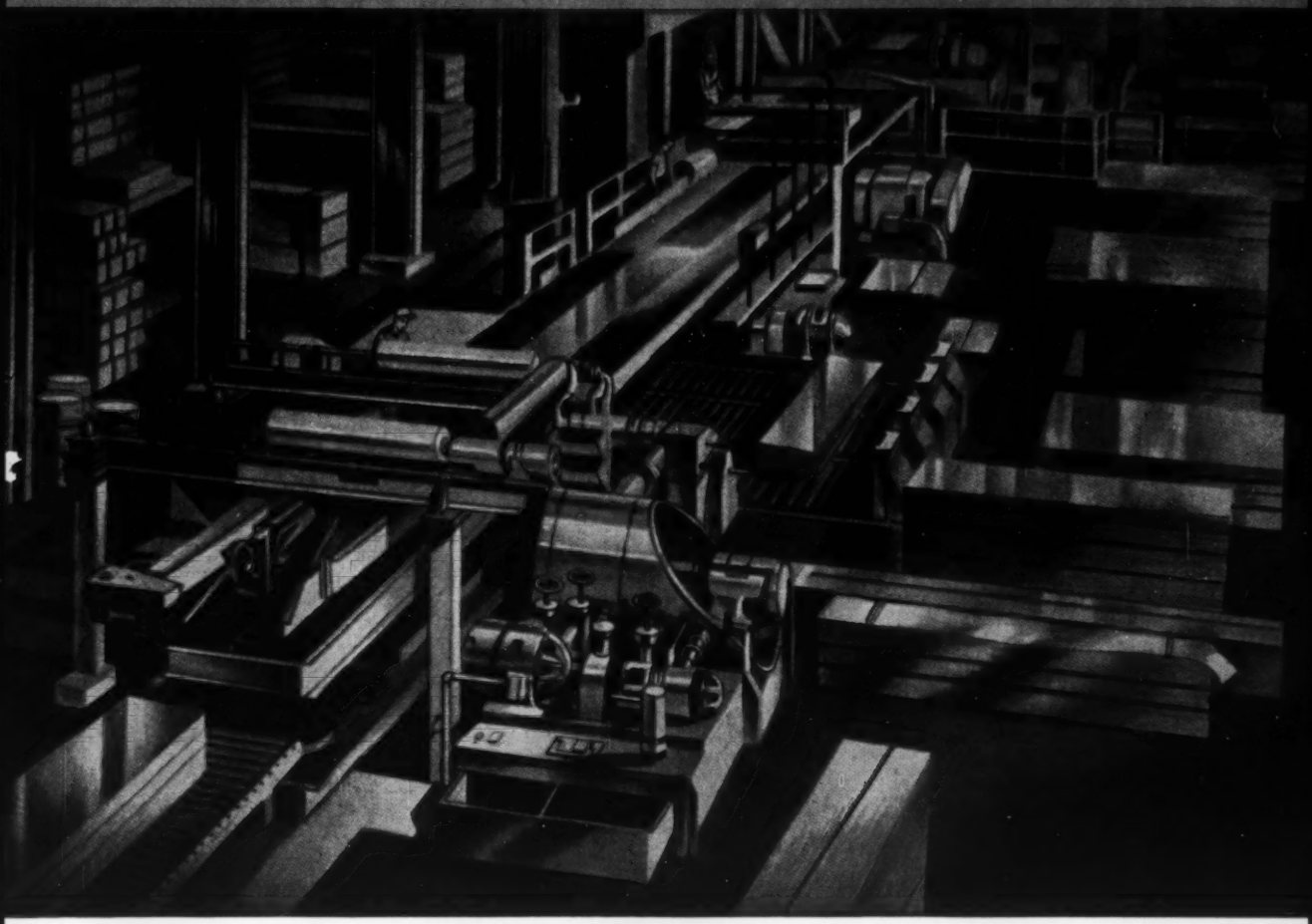
For Power Driven Conveyors, Use Landahl Chainless Conveyors

AMERICAN MONORAIL COMPANY

OVERHEAD HANDLING EQUIPMENT

13102 ATHENS AVENUE, CLEVELAND 7, OHIO (IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.)

54 YEARS OF DESIGNING AND BUILDING EQUIPMENT



CUT, SHEAR, TRIM, SLIT, STRAIGHTEN, COIL,
UNCOIL, SCRUB, DRY, CLEAN, PILE, CONVEY...

AETNA • STANDARD MAKES THE EQUIPMENT

• In the general category of Finishing Equipment, Aetna-Standard designs and builds many different types of products and equipment.

Major Aetna products include complete lines such as Side Trim and Shear, Automatic Gauging and Classifying. Individual items include such products as the patented Sheet Classifier, Levellers, Payoff and Tension Reels, Pilers and other machines or equipment for cutting, shearing, trimming, slitting, straightening, coiling, uncoiling, scrubbing, drying, cleaning, piling or conveying.

We can build equipment for processing any conventional shape, size or weight material.

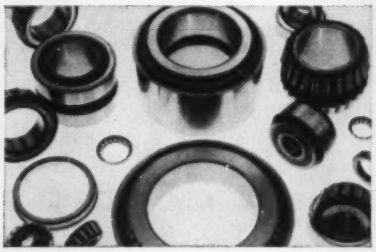
AETNA • STANDARD

THE AETNA-STANDARD ENGINEERING COMPANY

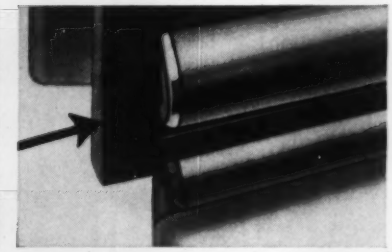
GENERAL OFFICES: PITTSBURGH, PA. PLANTS: ELLWOOD CITY, PA., WARREN, OHIO

CONTINUOUS GALVANIZING LINES • CONTINUOUS ELECTROLYTIC TINNING LINES • SIDE TRIMMING AND SHEAR LINES AND OTHER FINISHING EQUIPMENT • CONTINUOUS BUTT WELD PIPE MILLS • SEAMLESS TUBE MILLS • DRAWBENCHES AND OTHER COLD DRAW EQUIPMENT • ROLLS AND CASTINGS • EXTRUDERS, MILLS, PRESSES FOR RUBBER AND PLASTIC

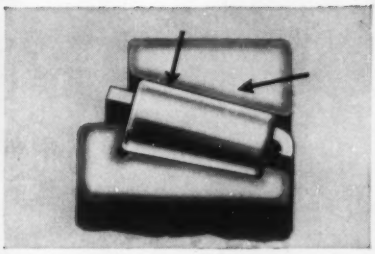
Get all these advantages . . . specify TIMKEN® tapered roller bearings



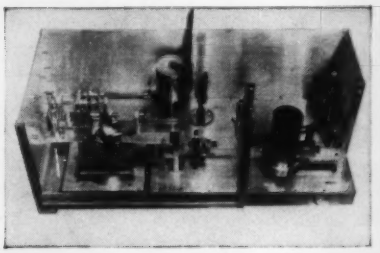
THERE ARE 27 TYPES of Timken® tapered roller bearings. This wide selection means you get the bearing design exactly suited to your job. Whatever your bearing application problem, we can help solve it.



THE SOFT STEEL CAGE used in Timken tapered roller bearings separates the rollers, keeping them spaced evenly. This prevents scuffing of the rollers, adds to the bearing life and gives you more for your money.

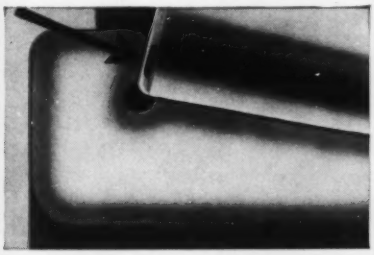


HARD ON THE OUTSIDE, tough on the inside. To take shock loads, give longer life, Timken bearing rollers and races are case-carburized to have a hard, wear-resistant surface over a tough, shock-resistant core.

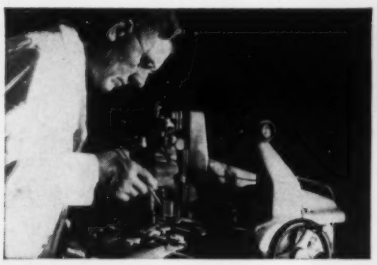


MICRO-INCH FINISH is standard for Timken bearings. This profilograph checks contours and smoothness of circular surfaces to a millionth of an inch, helps us make Timken bearings truer, quieter, longer-wearing.

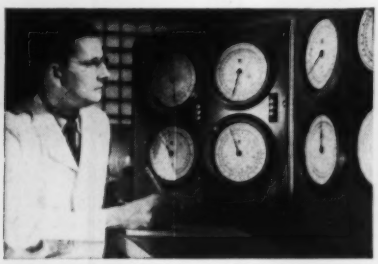
6,525 SIZES, the world's largest selection of tapered roller bearings. From bearings smaller than your finger to 71½" in inside diameter, the Timken Company can supply the size you need for any specific application.



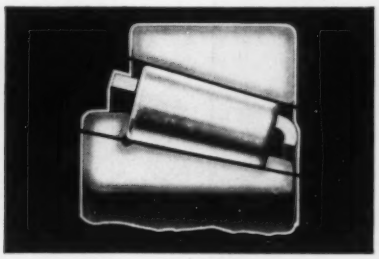
POSITIVE ROLLER ALIGNMENT is assured because the taper in Timken bearings holds ends of rollers snug against the rib. The taper in Timken bearings lets them take radial or thrust loads or any combination.



ACCURATE TO 50 MILLIONTHS of an inch. This Universal Measuring Machine checks gages and machine parts used to make Timken bearings. Our gage laboratory, one of the world's best equipped, helps make Timken tapered roller bearings your No. 1 bearing value.



ONLY FINEST ALLOY STEEL is used in Timken bearings. This spectrometer helps control its quality—in 40 seconds gives the exact chemical analysis of a melt. In a few minutes, results are flashed to the melter. It's another step in rigid quality control.



FULL LINE OF CONTACT between Timken bearings' rollers and races gives them *extra* load-carrying capacity. To get *all* these advantages, specify "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN *TAPERED ROLLER BEARINGS ROLL THE LOAD*

TRADE-MARK REG. U. S. PAT. OFF.